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THE INDEPENDENT GUIDE FOR APPLE COMPUTING

APRIL 1985

VOLUME 3
ISSUE 4

MONTHLY MACINTOSH COVERAGE

- C COMPILERS
- PASCAL PROGRAMMING
- MACTIPS

IS THERE A IIc IN YOUR IIe?

THE IIe ENHANCEMENT

- APPLE III SOFTWARE UPDATE
- DISK-DRIVE REPAIR

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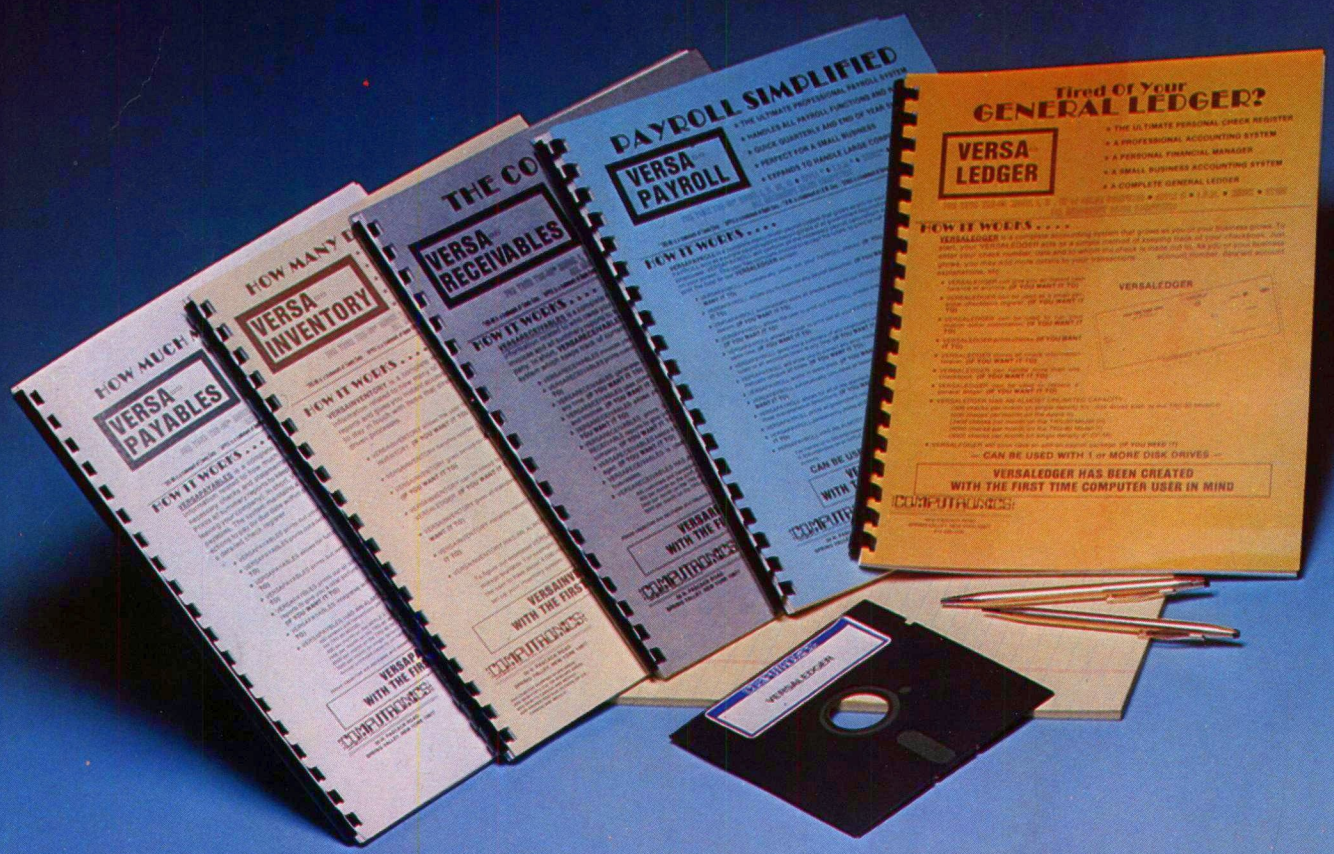

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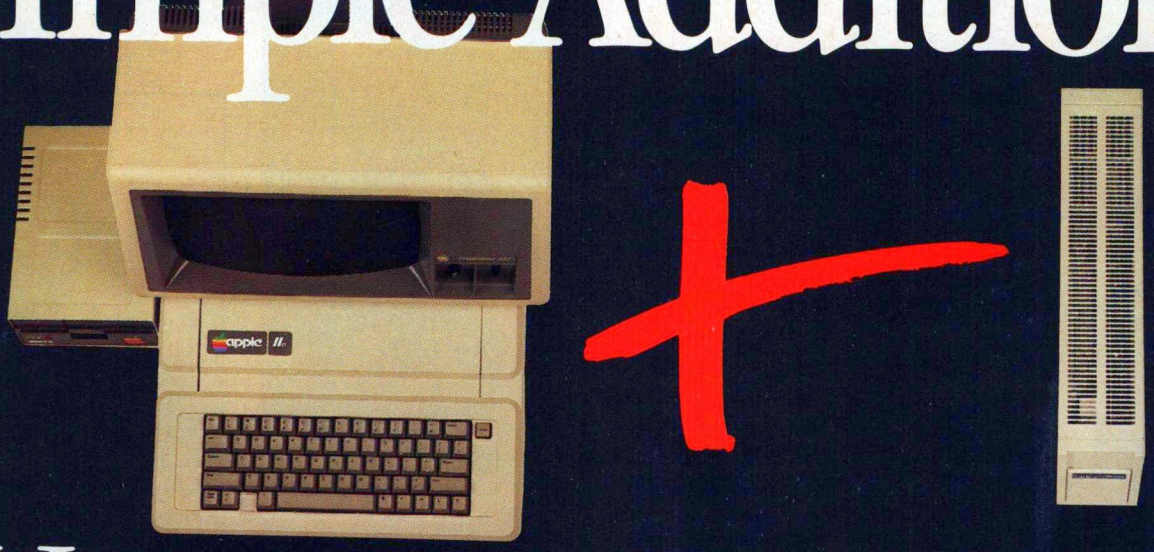

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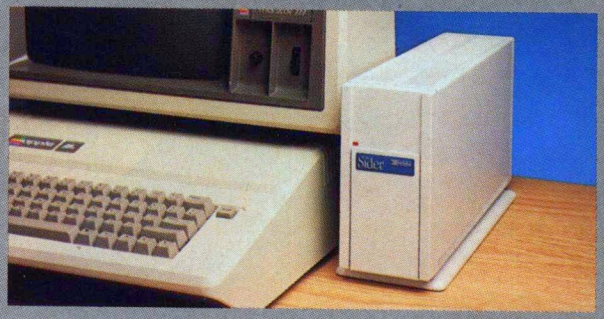

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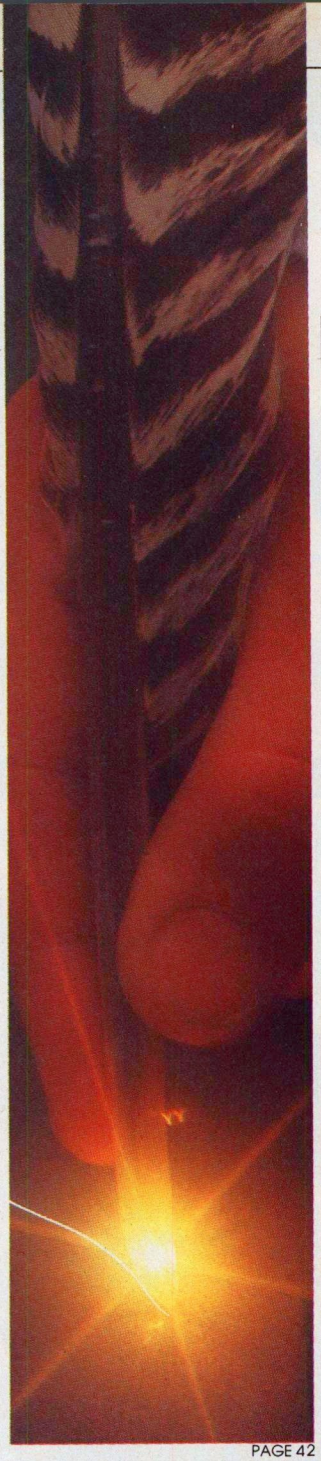

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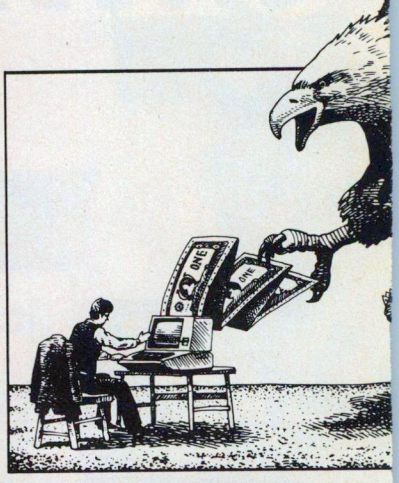

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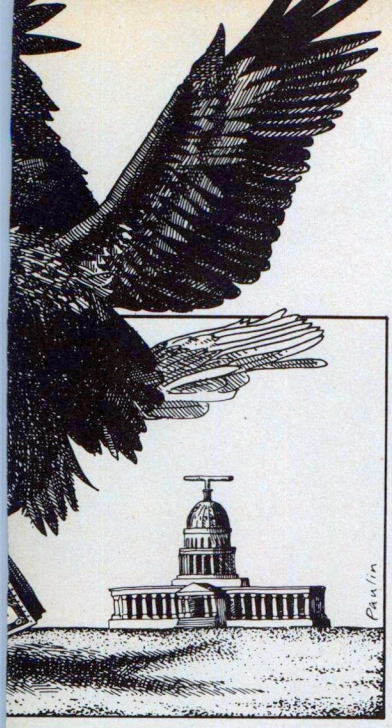

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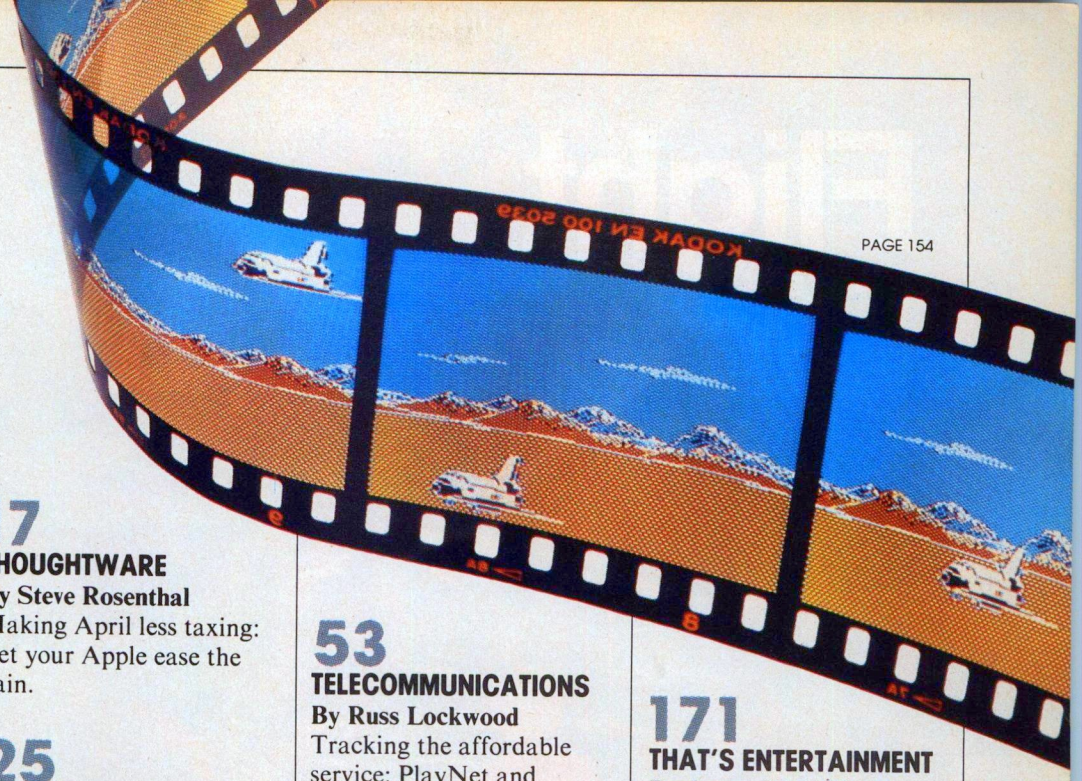

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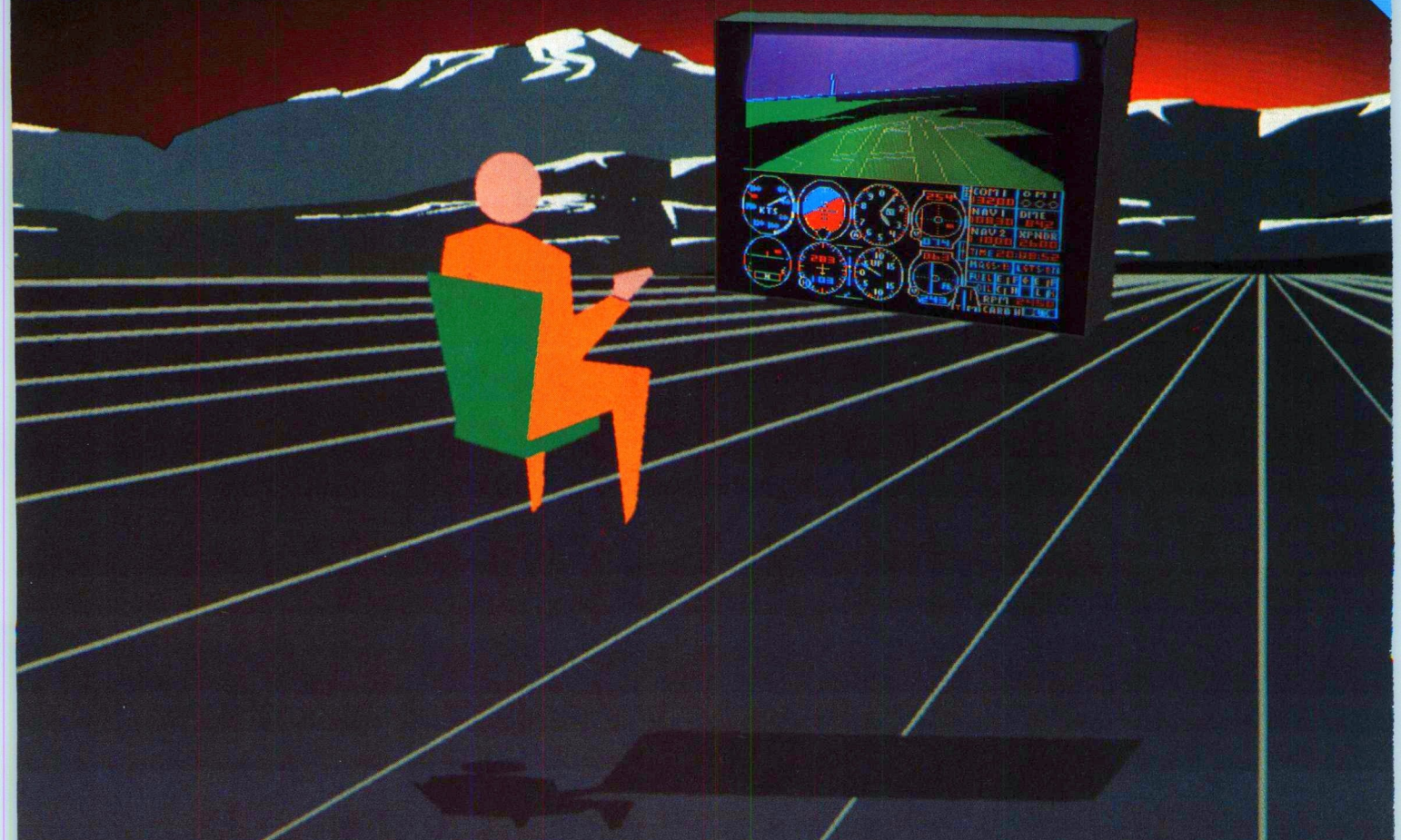

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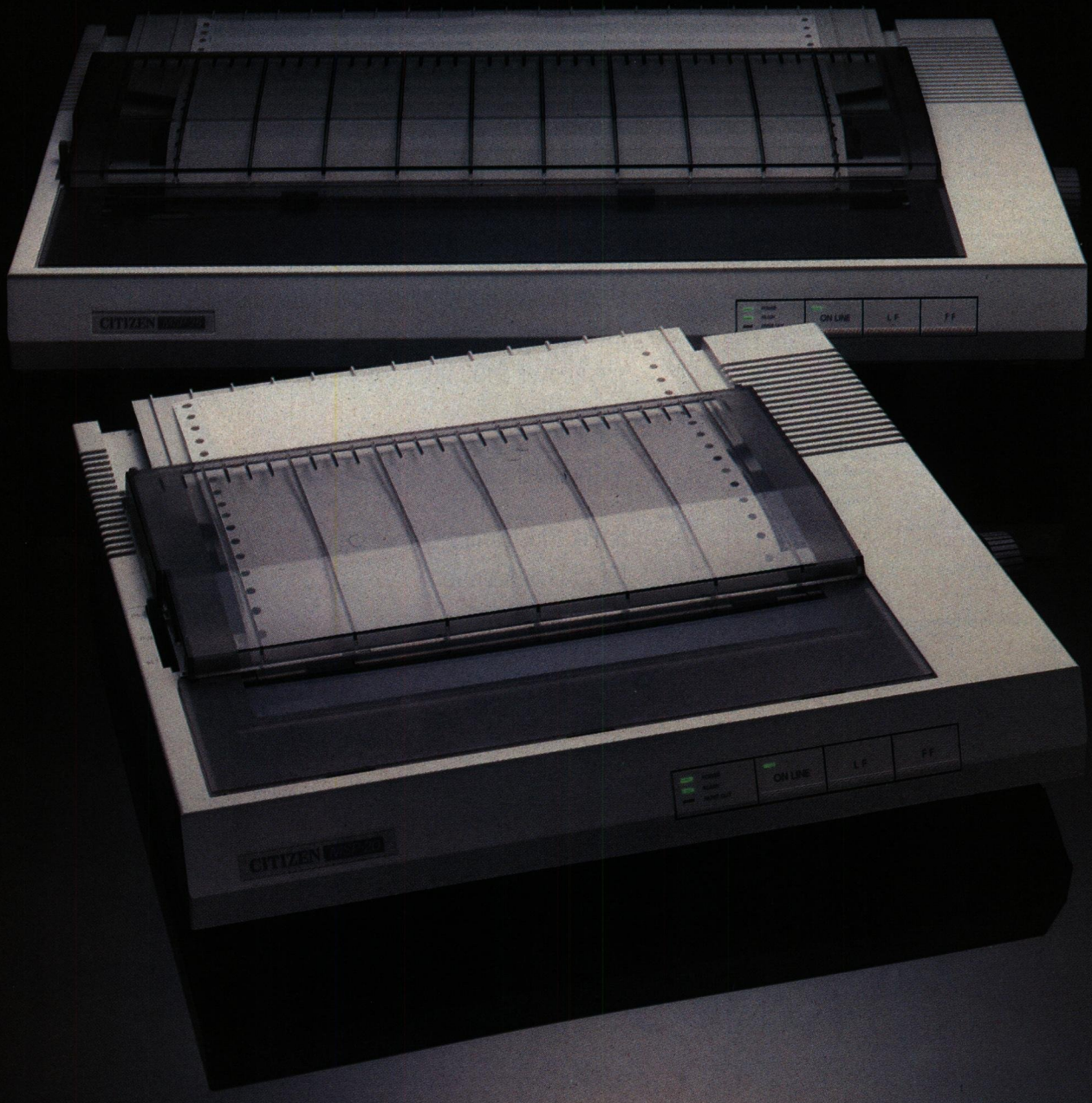

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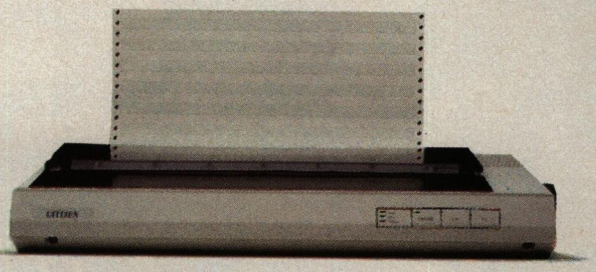

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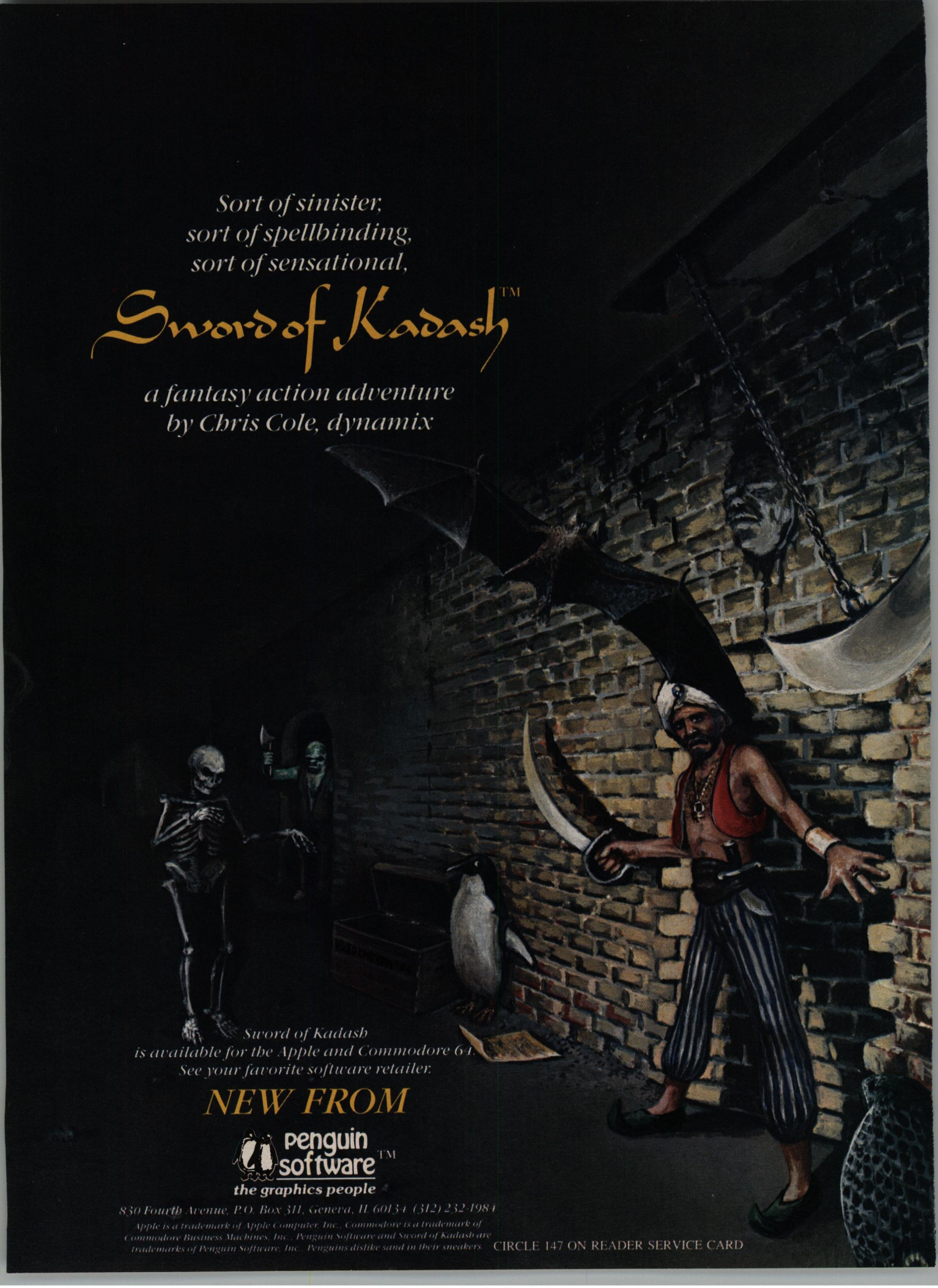
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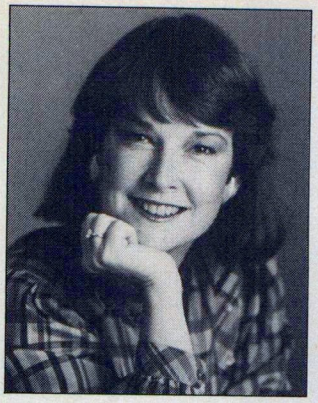

The debut of innovative new products and loads of software for your Apple highlighted the 1985 Winter CES.

THE COMPUTER'S NEW CLOTHES

As a confirmed gadget freak, I was in heaven at the Winter Consumer Electronics Show (CES) in Las Vegas in January. This event showcases all the new electronic devices that are designed to thrill your senses and drain your pocketbook. Products exhibited at the CES run the gamut from televisions to videocassette recorders to computers. It was interesting this year to see trends in the personal-computer industry reflected in the new consumer electronic products.

One of the most spectacular examples of this crossover technology, the new digital televisions offer windowing capabilities that let you bring up windows of any size to view another channel. You can also enlarge part of the same program you are watching. Speaking as a football widow, I know how much football fans will love being able to watch two games at once on the same screen!

Typewriters have taken on new dimensions, too. Now you can get Macintosh-looking type fonts out of electronic typewriters. Even though it would have taken days to print anything longer than a sentence, the concept was captivating and an indication of what we can expect to see in the near future.

Computers were the real stars of the show, however, in spite of these attractions and a few others—such as cellular phones, flat-screen and stereo TVs, portable VCRs, 8mm videotape technology, and satellite dishes. The main attractions were Atari's new Macintosh look-alikes—the 130ST (128K RAM) and the 520ST (512K RAM)—dubbed the Jackintosh, and the numerous MSX machines from Japan. MSX is an operating system for 8-bit computers that Microsoft developed, and many Japanese companies are adopting MSX as a standard operating system. I doubt that MSX machines will make a significant impact on the American marketplace. Based on 8-bit technology, MSX seems to be too little too late. We will, however, undoubtedly soon see television sets with MSX computers built into them, such as those Sony was demonstrating for interested show-goers.

A particularly large crop of educational software for the Apple family of computers was announced at CES. A noticeable trend showed that product pricing seems to be dropping below the $25 level. Spinnaker Software's new line of products, published under the Fisher-Price label, was one example.

One of the more interesting product announcements described The Newsroom, from Springboard. The Newsroom lets you design, produce, and print your own mininewspaper, using an Apple II.

Space Tablet, a three-dimensional-input device, was the most innovative product I saw. Users just point the ultrasonic pointer at the screen and either click on the menu, draw a picture, or use it to play a game. It works with the Apple II series and all software that supports game paddles or joysticks, and it can operate within a six-foot area in front of the computer display. Space Tablet is the first product from a new company called Soniture, Inc., owned in part by one of the industry's pioneers, Paul Terrell.

"Pipeline" contains more information on the products I've mentioned and others that were announced at CES this year. +

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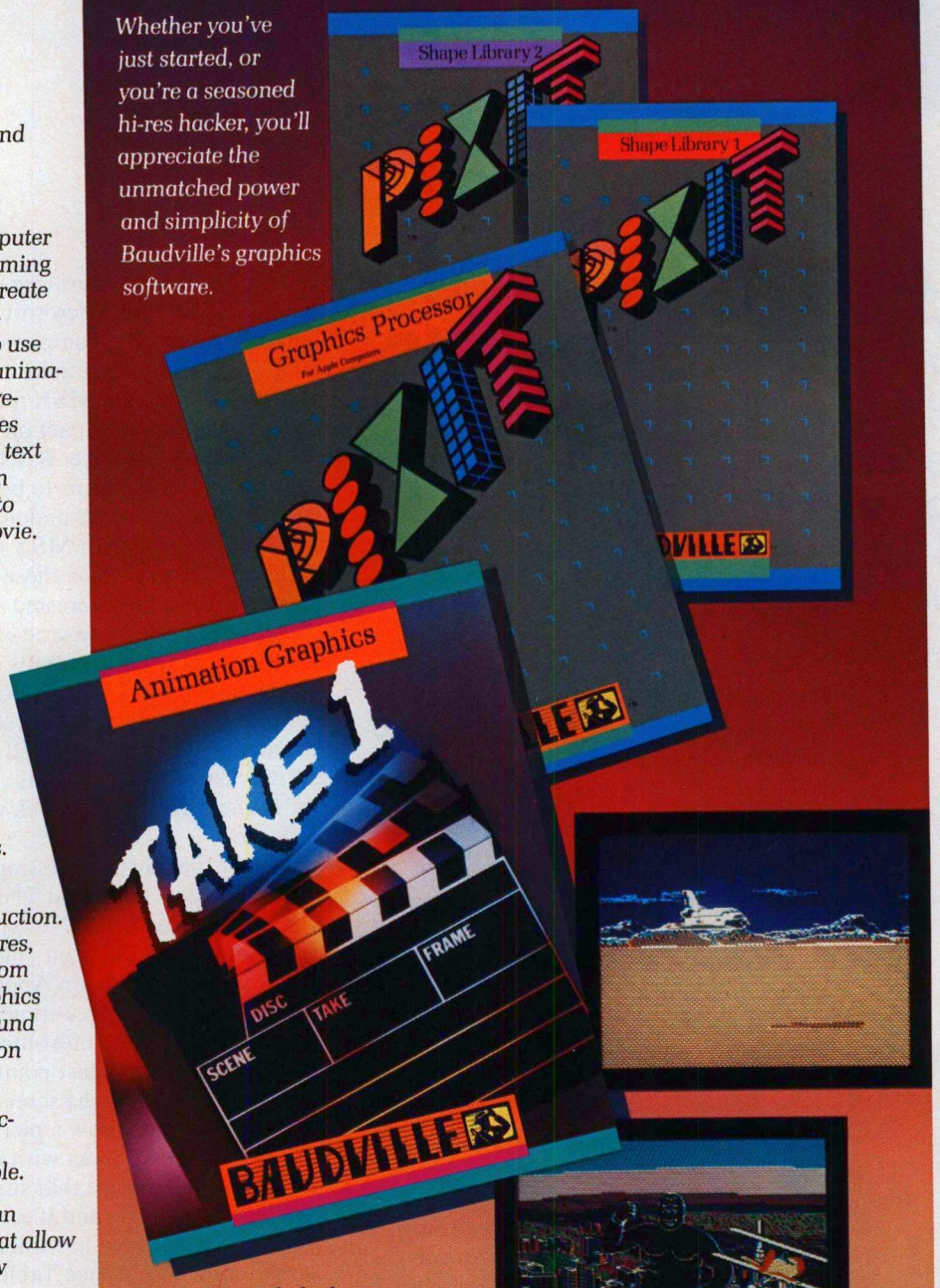

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LETTERS TO THE EDITOR

KITCHEN SINK CAD

Dear *A+*,

Steve Rosenthal's article on CAD systems for the Apple was excellent, but one CAD system was not included in the review because of its newness to the market.

The program is called CADDRAW and is published by Kitchen Sink Software. Since its release in September 1984, several hundred copies have been sold to school systems across the country to introduce students to CAD.

CADDRAW has the following features:

- Works on the Apple II Plus, IIe, or IIc
- Operates cursor from keyboard only or uses joystick, paddles, or mouse
- Includes line plotting at any angle
- Has shape tables, including architecture, electronics, plumbing, landscape, etc.
- Rotates shapes, lines, and text in four directions
- Automatically centers 2-D or 3-D drawings on any of four title blocks and borders

CADDRAW is available from Hearlihy & Company, 714 West Columbia Street, P.O. Box 869, Springfield, OH 45501. The CADDRAW disk and manual sell for $59.50.

Guy Forsythe
Kitchen Sink Software
Westerville, OH

THE MAC AT SCHOOL

Dear *A+*,

When the Macintosh was introduced over a year ago, I knew the perfect spot for it would be in the hands of elementary-school children. So with a little help from my principal, the Macintosh was added to our computer curriculum.

To say it has been a hit would be an understatement. The Macintosh aids students from kindergarten to the sixth grade in doing everything from creating graphics for their student-authored books to recording the results of hydrochloric-gas experiments.

When school is over, the Macintosh "stays after school" for some additional work with teachers, librarians, and secretaries who are finding out what all the excitement is about.

Kevin Silberberg
Maple Elementary School
Hesperia, CA

CAD/CAM/CAE OMISSIONS

Dear *A+*,

We have just noticed the chart on CAD/CAM/CAE products by Huajardo and Carman in the December 1984 issue of *A+*. We were disappointed that no mention of our products was made in this chart.

NLLSQ (Nonlinear Least Squares) is a data-analysis program that lets you perform both nonlinear- and linear-regression analysis of your data with your choice of model.

SEQS (Simultaneous Equation Solver) solves algebraic equations—it can solve a single linear, nonlinear, transcendental, or mixed equation for any real variable, or a family of simultaneous equations including up to 20 equations and 20 variables.

French Curve (Cubic Spline Smoothing) employs a running cubic spline to smooth tabular data containing up to 600 pairs of x, y values.

Edwin E. Tucker
Vice President
CET Research Group, Ltd.
P.O. Box 2029
Norman, OK 73070

DENTAL SOFTWARE

Dear *A+*,

I enjoyed the "Open Wide" article by Lindsay McGrath in the December 1984 issue of *A+*. Your subscribers who are in the dental profession should also be aware of a software package called Pru-Dent Lydell 2.0 by Lydell Creations (P.O. Box 2754, Dublin, CA 94568). The software has been working flawlessly for two years. It computes and prints private-patient billing statements, recall notices, ADA's J512 claim form and the CDS claim form, and also doubles as an electronic memory typewriter. And you don't need to resort to nitrous oxide to afford the $295 price!

Dr. Wendell A. Kawahara
Pleasanton, CA

PUBLIC-DOMAIN SOFTWARE

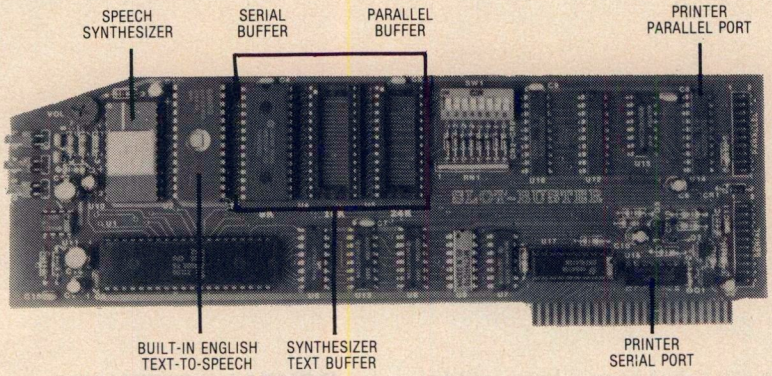
Dear *A+*,

Your January article entitled "Software on a Shoestring" was very informative and comprehensive. I would like to add our company, The Public Domain Exchange, to your list of public-domain-software suppliers for the Apple family of computers.

We carry more than 275 disks for the Apple II series and 30 for the Macintosh. Our library is growing, and we encourage submissions of new programs in exchange for our disks. Disks are categorized by subject: business, math and statistics, utilities, education, games, graphics, Eamon adventures, Pascal, CP/M, and Forth. The programs, usually more than 20 of them on a disk, are described individually in our new book entitled *The Best of Apple/Macintosh Public Domain Software.*

The book is available from book-

If You've Got A Slot, We've Got The Card.



SLOT — BUSTER™

The New Generation Peripheral Card for the Apple II, II Plus, and //e

The Slot-Buster is the first complete **six-function** card available for the Apple II series computers. It contains fully software compatible Centronics parallel and RS-232 serial printer interfaces for accessing correspondence and letter quality printers. And with the built-in printer buffers, you'll be able to use your Apple while the Slot-Buster takes care of printing your documents. Two documents at once, if you like!

Also included in the Slot-Buster is the most innovative and first really *useful* speech synthesizer that leaves all the others utterly speechless. It's so intelligent, in fact, that you can easily teach it to speak foreign languages, or create an unlimited number of sound effects. Using it couldn't be simpler either, because you access it just like a printer from within your programs. Even program listings can be directed to the synthesizer for verbal output. And another first. . . *The synthesizer's internal text-to-speech rules can be easily redefined for virtually any spoken language.* (We've even included Spanish text-to-speech rules on disk, free!) And with the built-in text buffer, there's never any waiting.

If you're worried that all of these advanced features will bog down your Apple, stop worrying. A fast and powerful on-board Z80-based computer oversees all of the Slot-Buster's functions, so your Apple doesn't have to. In fact, *the Slot-Buster doesn't even use any of your Apple's memory!* We think you'll also be pleasantly surprised with the Slot-Buster's price - it's only slightly higher than you'd expect to pay for a card with only one function.

The Slot-Buster is compatible with all popular printers including Apple's Imagewriter. All functions are compatible with AppleWorks, BASIC, PASCAL 1.1, and CP/M. Free disk software includes a hi-res printer dump program that supports both single and double hi-res graphics, a self-test diagnostic program, and more.

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stores or by mail for $4.95 plus $1 for shipping and handling. Apple disks are $5 each; a set of six of the most popular disks plus the new book is $33 (free shipping). Macintosh disks are $10. To receive a free listing of Macintosh programs, just send us a self-addressed, stamped business envelope. Contact us at The Public Domain Exchange, 673 Hermitage Place, San Jose, CA 95134 or call (408) 942-0309.

Judy Rosenthal
The Public Domain Exchange
San Jose, CA

CORRECTIONS

AppleWorks

Our review of three integrated-software packages, "Trying Out Integrated Software" (January 1985, pages 80–87) contained several inaccuracies. The following information should clear up any confusion:

1. AppleWorks works on the Apple IIe with 64K RAM or 128K RAM, but its capabilities are very limited with only 64K RAM.
2. To shortcut through the printer options when you want to boldface text, use the special command Control-B, as suggested on page 167 of the *AppleWorks Reference Manual.*
3. AppleWorks' Spreadsheet module has a function that changes the width of individual columns (page 214 of the *AppleWorks Reference Manual*).
4. The spreadsheet does not subdivide the text of long labels into multiple cells. What really happens is that when you enter a long label, the program automatically moves the cursor to the adjacent cell.

MacWrite Versions

The disk-based version of MacWrite, which we called Version 3.3 in "Mind Your Words!" February 1985, pages 100–104, continues to undergo revisions. The final release will probably have a version number higher than 3.3. When you go to your dealer to upgrade your MacWrite disk, simply ask for the disk-based version.

MacLion

A new-product announcement in our February 1985 "Pipeline" section contains two errors. On page 157, we state that the list price of MacLion is $626, but the price is actually $379. In addition, the picture caption that reads "Computer Software's MacLion" should read "Computer Software Design's MacLion."

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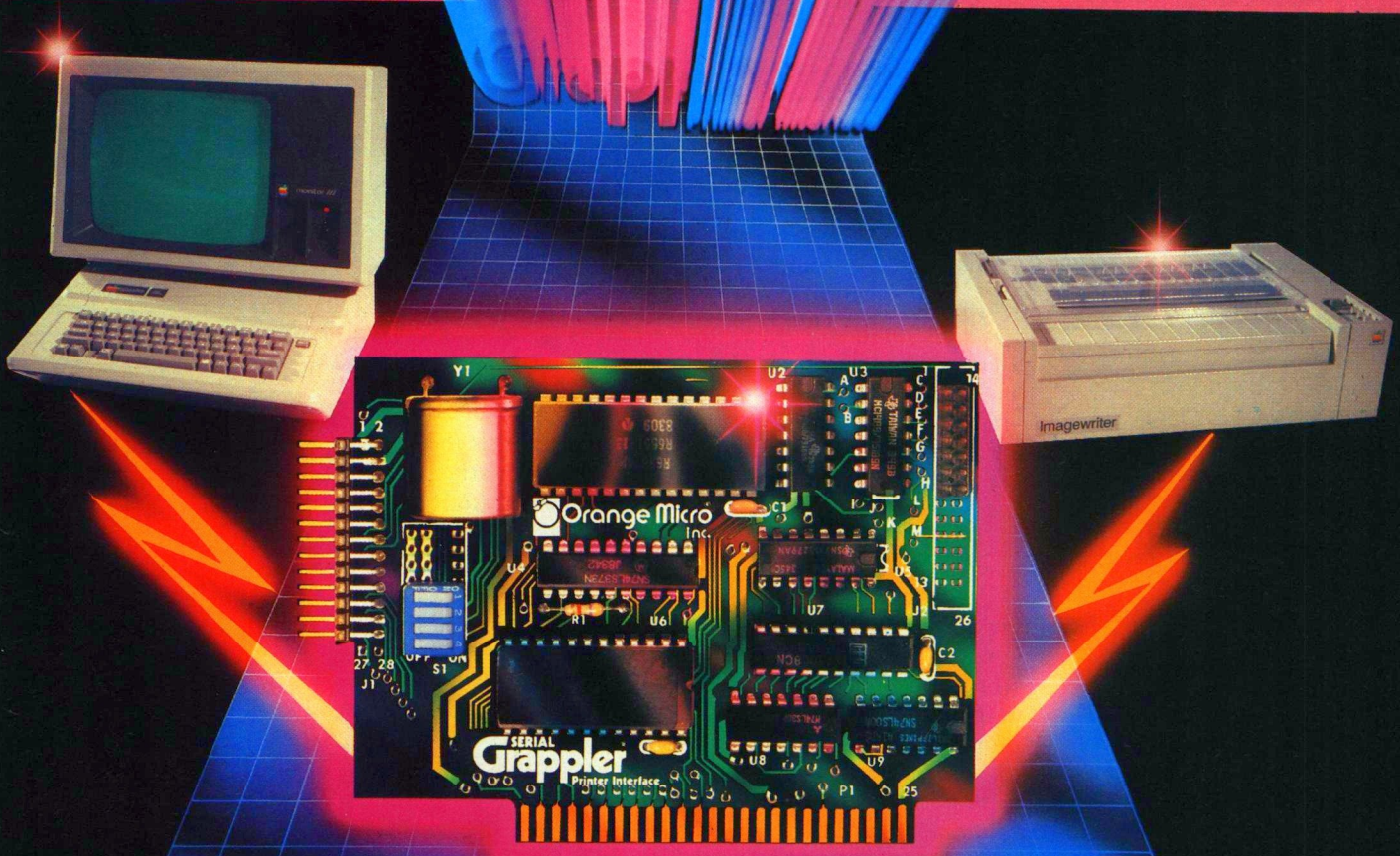

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With the Serial Grappler you won't need complicated software to print your text or graphics. A few simple keystrokes is all it takes.

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The Bufferpak comes standard at 16K, and is upgradable to 32K or 64K of memory. In no time you'll be experiencing the time saving benefits of buffering.

Grappler products are available through Apple dealers and computer stores throughout the world. For more information, visit your Orange Micro dealer today.

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CIRCLE 252 ON READER SERVICE CARD

NEWS+

BY FREDERIC E. DAVIS

A SHOW FOR SHAREHOLDERS

Apple Computer's 1985 shareholders' meeting on January 23 had the usual Apple PR flair. John Sculley, president and CEO, and Apple cofounder Steve Jobs officially introduced the Macintosh Office strategy that we featured in last month's *A+*. Jobs and Sculley gave a lighthearted demonstration of the AppleTalk network and the LaserWriter, complete with science-fiction-style special effects.

Sculley gave a retrospective of 1984 and took a look into the future as well. As for 1984, Sculley said,

WILLIAM CONE

"... 1984 was a year of triumph for our company. It was a year when Apple reclaimed its role as the industry innovator. It was the year when Apple changed forever the ground rules for marketing in an entire industry. And it was the year when Apple established itself as the unquestioned challenger to IBM."

As for the future, Sculley said, "Nineteen eighty-five will be the year of implementation. We want to strengthen our partnership with our dealers and begin the transition from just a few computers in grades K through 12 to the computerized classroom of the future [where] Apple IIs will be networked together.

"Nineteen eighty-six will be a year for new products [that] will continue to build on the product-line strategy that we implemented in 1984. With optical-disk-storage technology becoming available, we believe home learning will truly become interactive by the end of 1986.

"Nineteen eighty-seven, we believe, will be the beginning of the next boom years in the personal-computer industry. By that time, Apple will have all of the products, sales, and distribution infrastructure in place, and we will be extremely well positioned to be a powerful leader through the last years of the decade."

ADAM BOMB

Coleco's Adam computer is the latest victim in the home-computer shakeout. When the Adam was first introduced, it received a lot of media attention because the entire system, including a letter-quality printer, was to retail for less than $700.

The cabbage-patch computer never met Coleco's expectations, however. The remaining inventory of Adams was sold to Montgomery Ward, which is selling the systems for as low as $300 each.

DETENTE WITH IBM

Steve Jobs says that the Macintosh Office strategy calls for detente with IBM. According to Jobs, that is why Apple has planned for the use of IBM PCs and Macintoshes in the same work group. It also explains Apple's bold entry into the IBM PC peripheral market with the LaserWriter and a special AppleTalk board, both targeted at the IBM PC aftermarket.

But the battle still goes on, and Apple is making remarkable headway in some respects. According to a recent *Advertising Age* "Ad Watch" survey, 37.5% of the people surveyed thought of Apple first when they thought of personal computers; only 13.7% thought of IBM first.

LISA NOW MAC XL

Apple Computer has renamed the Lisa. The Lisa 2/10 is now the Macintosh XL (the *XL* stands for either *extra large* or *ex-Lisa*, depending on whom you talk to). To avoid competition with the 512K Mac, the Lisa 2 and Lisa 2/5 are being phased out.

According to Apple, many people have been asking when there would be an expandable Macintosh with more memory, a larger screen, and a built-in hard-disk drive. Apple already had such a machine, the Lisa 2/10, which has a ten-megabyte built-in hard disk and is expandable to two megabytes of RAM with a newly introduced memory-expansion unit from AST Research. Apple says it will offer a smooth migration path for current Lisa owners that will transfer files from Lisa 7/7 software to Macintosh software such as MacWrite, MacProject, MacDraw, and Jazz.

FIRST-CLASS BARGAIN

You may have noticed the splashy ads in *A+* recently for a ten-megabyte hard disk for the Apple II called the Sider that costs a mere $695. Quite a bargain, considering that Apple's ten-megabyte ProFile hard disk retails for around $2000. The Sider is being offered only by mail order from a new company called First Class Peripherals, which is a division of Xebec, one of

the best-known hard-disk-drive manufacturers.

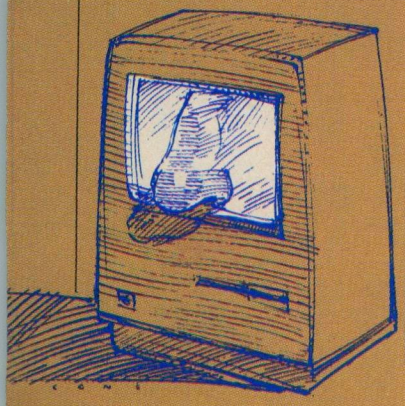
First Class Peripherals president C.B. Teegardin (who is also a vice president of Xebec) says he wants to make First Class Peripherals the L.L. Bean of computer peripherals by offering quality products at discount prices. The Sider is the first of several peripherals First Class Peripherals will offer this year.

Teegardin says the Sider can be offered at such a low price because the product is sold directly from the manufacturer to consumers without a lot of middlemen. Watch for an in-depth review of the Sider by our contributing editor Chris Albertson in an upcoming issue of *A+*.

MACNOSY

Ever wonder what makes your Macintosh tick? Do you like delving into the inner secrets of Macintosh programs? If so, then you will find MacNosy to be an invaluable tool. MacNosy is a dissassembler for the Macintosh that lets you sniff around inside Mac software.

The MacNosy disassembler was written by Steve Jasik, a programming whiz with more than 17 years of experience writing compilers and other complex software tools. The program is designed for developers and other advanced Mac programmers and is quite powerful. MacNosy is definitely not for casual Mac users. MacNosy is available for $70 from Free the Rom 64, 343 Trenton Way, Menlo Park, CA 94025.



EXPANDABLE MAC

Several developers are working on ways to expand the Macintosh beyond its current configuration. One of the most interesting projects is that of Turbo Technologies of Glen Head, New York, which is planning to manufacture a one-megabyte RAM-expansion board that is wired directly to the 68000 CPU. The company says it will honor existing Apple warranties and will provide its own 90-day warranty and optional one-year service contract.

The modification also provides access to the 68000 bus structure and permits the connection of an expansion box that fits underneath the Mac and contains peripheral slots for add-on cards. Some of the add-on cards now under consideration are a card with up to four megabytes of additional RAM; coprocessor cards; a speedup card; and a color-monitor card. For more information, contact Turbo Technologies, 70 Glen Cove Drive, Glen Head, NY 11545; (516) 671-1301.

EYETYPER

EyeTyper is a special camera-equipped keyboard that can be controlled with eye movements. Developed by research engineers at Carnegie-Mellon University, this device allows physically handicapped people to use computers almost as easily as they can watch television. Although the EyeTyper is expensive, retailing for $8000, it opens new opportunities in computing for the handicapped. EyeTyper is available from Sentient Systems Technology, Inc., of Pittsburgh, Pennsylvania.

SWITCHER

Switcher is a utility program for 512K and larger Macintoshes that lets you load several applications into the Mac's memory at one time, thereby allowing you to switch between programs without having to quit and reload each time you change. Although only one application is active at a time, cutting and pasting information between programs is a breeze.

An interesting rumor about Switcher was going around last winter. Andy Herzfeld, one of the original Mac designers, is writing the program, but the original idea for Switcher apparently came from technology writer John Markoff, who showed Herzfeld a similar IBM PC program called Memory/Shift and inspired Herzfeld to create such a program for the Mac.

According to the rumor, Apple was so anxious to announce Switcher at Apple's January stockholders' meeting that it offered Herzfeld $100,000 if the program was ready by the meeting. Although Steve Jobs gave a brief Switcher demo at the meeting, Herzfeld apparently didn't quite meet the deadline. I'm sure Herzfeld will be well rewarded for his efforts, however. Watch for Switcher to appear soon. ✚

CHRIS SPOLLEN

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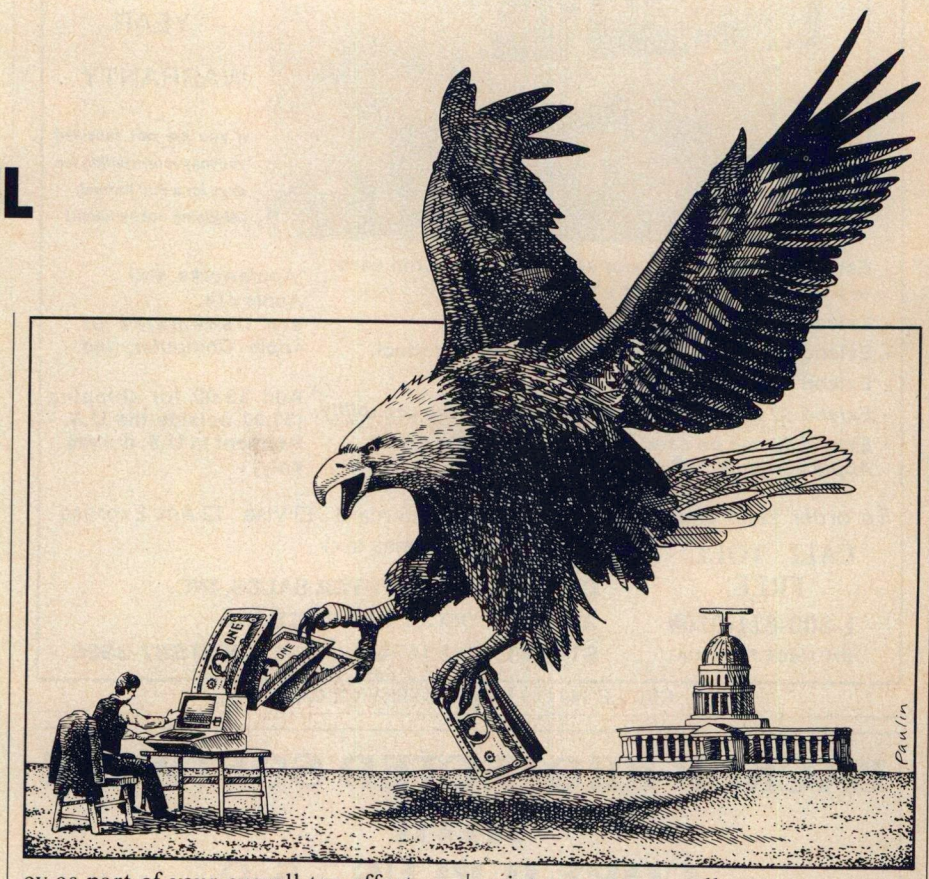

DOUG PAULIN

You definitely need a personal computer on *your* side when you compute your taxes—after all, the tax people have an unlimited supply of giant mainframes on theirs. Whether or not it's too late to do anything about this year's return, you may want to start thinking about how you can use your Apple to make annual tax accounting less painful.

A computer won't reduce the tax rates; insure your money is well spent; create new loopholes; or tell you what is moral, safe, or legal. What it will do is take care of the onerous arithmetic and clerical chores, letting you get your work done faster and more easily. If your financial situation is flexible enough to permit choices, computerizing your taxes may also give you the help you need to make choices and institute a deliberate tax strategy.

Widespread use of personal computers, moreover, may change the operation of the tax and financial system over the next decade. A system now designed for humans and mainframes will be visibly altered when microcomputers become as ubiquitous as toaster ovens. Already, the main Internal Revenue Service 1040EZ form is designed to be read by machine. In a few years, you may be able to select a 1040 Floppy as well.

You can find scores of programs that will help you use your Apple in your task. Along with tax-preparation programs, you may have occasion to use accounting, database, spreadsheet, graphing, calendar, and simulation programs. Tax record keeping, planning, and payment are so intertwined with every form of economic activity that you should view any program to help you make, spend, or keep track of money as part of your overall tax effort.

In fact, the biggest chore in the whole tax process is not the tax preparation; it's the accounting. Before you can even think about filling out your tax forms, you have to have ready a whole string of figures for your income, expenses, deductions, and credits. In general, the tax code doesn't state the exact form your books should take, but it does require that they be complete and accurate enough to determine your true tax liability.

The biggest chore in the whole tax process is not the tax preparation.

In the IRS's view, a computerized accounting system—or, as the IRS calls it, an automatic data-processing (ADP) system—must have a means to print out your overall accounts system, as well as all the subsidiary accounts and transactions. It must allow the tracing of any particular transaction from its initial entry into the books through any subtotals and totals and, conversely, to find what elements went into any composite figure (an "audit trail"). You must have available "a complete description of the ACP part of the accounting system," as well.

If you use a commercial accounting system such as Back to Basics or Home Accountant, it should meet all of these requirements (providing, of course, that you accurately enter all your transactions). If you write your own program, be sure to include the audit-trail capability and to document in detail the way your program works.

If your financial transactions are simple, you may not even need a complete accounting package. A database program that has arithmetic summation capability can take care of most smaller part-time businesses if you

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have only simple expense and income entries. You'll need some kind of sorting and selection capability, because the tax forms want to know both your total expenses and the outlays broken down by category. If your only income is a salary, you won't need a computer to keep your books (although your employer probably uses a computer to process your paycheck and compute your W-2 forms).

If you have an Apple and a business, chances are you're going to deduct the machine, at least in part, as a business expense (or in accounting terms, expense it or depreciate it and thereby reduce your profit). Remember that the IRS can require you to show that you had a reasonable expectation of actually making a profit with your business, a test you are presumed to meet if you report taxable income from at least two of five years of operation. Furthermore, new rules for deducting the cost of machines used partially for work and partially for play require that you keep a running log of the time spent on each application, with a minimum of 50% for business.

Most of these planning programs are specialized spreadsheets.

The Best-Laid Plans

Although Congress, in its wisdom, can change the tax laws at any point and is threatening a major shakeup this year, we know the operative tax at least for the current year and for the past. You don't have to wait until the following April to figure out what certain transactions will do to your taxes.

On the average, if you're someone with a lot of economic choices, you can use a tax-planning program (until, of course, you get into the echelon that has a tax-planning staff). These planning programs let you examine the tax effects of some of the more common types of economic transactions. For example, Personal Tax Planner (from Aardvark/McGraw-Hill) takes into account 46 different transaction classes and projects your tax forward for up to five years. If you sold your house, for example, what would be the tax consequences?

Most of these planning programs are, in reality, specialized spreadsheets, answering the same kind of "what if" questions that you might try out with VisiCalc or Multiplan. If you already

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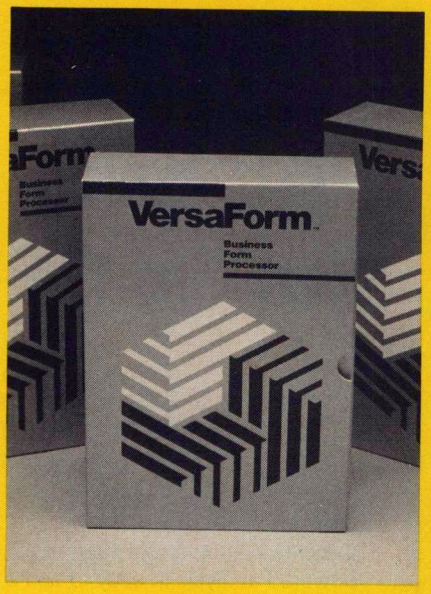

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Now VersaForm has made the database both powerful AND easy to use. Because it's based on your own knowledge of business forms, you can tailor it to your own needs. And because it's a full-featured database, it can do the jobs that lightweights just can't handle.

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* APPLE II — 64K, 2 DRIVES.
IBM — 2 DRIVES OR HARD DISK. 128K for VersaForm, 196K for XL.

have a spreadsheet, you may be able to find a template set that does the kind of financial planning you need right on your existing software.

Many tax packages also provide some kind of planning capability. These include The Tax Manager program Ken Landis discussed in his three-part tax series in *A+* this past December through February, and TaxWizard for the Macintosh, one of the programs I tried out in preparing this column.

You might also want to use the graphing features of a spreadsheet or accompanying charting package to help you in your decision making. Unless you're a practiced accountant, it's often hard to spot trends and patterns in long columns of figures. If you're considering a large number of alternatives, a computer's ability to draw you a picture may make grasping the information much easier.

From Summaries to Liabilities

No matter how you slice your income, at least once a year you do have to give the tax people their bite. At the higher income levels, or if you're self-employed, you may even have to do your computations quarterly!

The first step is to make sure your accounting is all squared away. The IRS frowns on any last-minute adjustments, but it is hard to get every single bookkeeping transaction right the first time. You may have to spend some time getting your books to balance and to match figures in the external world (such as your checking balance or credit-card statements).

Once you have some numbers from your accounting system, you're ready to turn to the taxes. Ideally, your accounting and tax programs would be so well integrated that you could instruct the system to follow the accounting totals with your complete tax return, but in practice it's not as easy as simply reprocessing the same numbers. Nevertheless, a few firms that market both accounting and tax software (such as Continental Software with The Home Accountant and The Tax Advantage) do include a feature that lets you transfer your accounting records straight into your tax data.

The best tax programs, for the Apple and for any other personal computer, are interactive. Although your figures should not mysteriously change to fit the circumstances, at tax time you still have a large number of what tax people call "elections." You can, for example, choose to take an investment tax credit for most equipment added for business use, but doing so reduces the allowable depreciation (the amount set aside to compensate for the equipment's wearing out). Certain added equipment can be expensed (deducted in a single year) or depreciated (deducted in parts over a series of years).

At least for this year, the tax code is still Byzantine in complexity.

At least for this year, the tax code is still Byzantine in complexity, with a corresponding multitude of possible forms needed to cover all the variations. Tax programs for the Apple II family or Macintosh generally cover between half a dozen and two dozen different forms, but if you're deeply involved with international banking, oil production, liquor sales, or the dozens of industries with special tax-code provisions, you might have to grab a pencil or call in a service, nonetheless.

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The Z-80c comes standard with the new 4.0 software, the most advanced system for running CP/M programs ever. But it also runs other versions of CP/M including the popular 2.2 and 2.23 and is fully compatible with Microsoft disks with no pre-boot.

But naturally you'd expect top performance from the Z-80c. After all, it's from Applied Engineering and we've got years of experience with Z-80 cards for the II+ and IIe.

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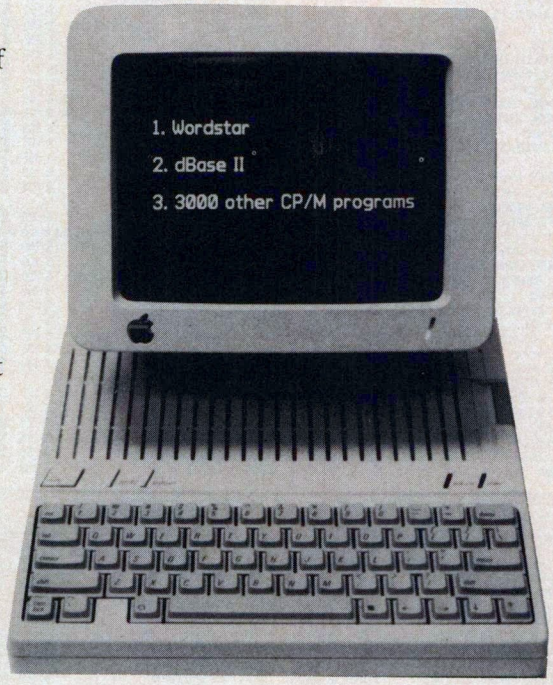

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CIRCLE 129 ON READER SERVICE CARD

For example, TaxWizard (Gamma Productions) for the Mac can fill out the following forms: 1040, 1040A, 1040EZ (including Schedules 1, A, B, C, E, G, W, & SE), 2106, 2119, 2441, 3903, 3468, 4137, 4255, 4562, 5695, and 6251. It's a nice program, with full use of the Macintosh visual interface. If you need a 4835 (farm-rental income and expenses) or 4684 (casualties and thefts), you're out of luck, though.

Nor will any of the full-fledged programs I looked at for the Apple do your state returns. Because the cost of keeping up with 50 mercurial state legislatures is too high for most firms, the state-tax-program business is largely claimed by local companies that primarily sell templates for spreadsheet programs. Fortunately, most state returns are much simpler to do, because they're usually based on the figures you enter on the federal forms.

Some programs come in an individual-user model and a more complete "tax preparer" version. If you have a complex tax situation but still want to do your own return, you may sometimes find support for the forms you need in these more sophisticated packages. Softax (Design Trends Ltd.), for example, contains ten more forms in the preparer version than in the standard package.

EZ Is in the Eyes of the Beholder

If you're in the market for a tax program, either for a last-minute finish for last year's returns or an early start on the coming year, let me point out two features I found particularly useful on some of the programs that I looked at. Look for a tax program that lets you put in data in the order you choose but prints out the data in the sequence the IRS sets.

Because tax preparation is still largely a paper-based industry, the tax forms' layouts assume that you'll work your way down the form 1040, branching off to the supporting forms and schedules as needed (it's almost like a program with subroutines). The best tax programs not only let you skip back and forth among forms as needed, but they also automatically duplicate any figures you change on one page on all the other affected schedules and forms. Some programs then proceed to recalculate all affected forms; others wait until you bring each form back up to give you any revised totals.

Although you want to be able to work in a branching order, you want the results printed out to approximate the actual forms. According to the IRS help line, the Feds prefer that you don't actually use a computer to type out your forms and schedules, unless you're using a program that creates officially approved forms, but they apparently will take equivalents that include all the required information in the same order and general layout, if it's just for your own return and not one that you've prepared for someone else. To placate the tax people, you at least want the software to print out a simulated return with the numbers right where they would go on the form—it'll simplify your manual copying process.

If you get your books and then your taxes on your computer, someday you may have one of the moments we've all been waiting for. You get a letter or phone call from the revenuers, and you can finally say, with a straight face, "Those numbers must be right; *my* computer says . . ." +

Steve Rosenthal is a writer and lexicographer who tries to maintain a perspective on other joys and problems in the world besides those involving personal computers.

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CIRCLE 466 ON READER SERVICE CARD

DISKTALK

▶ APPLEWORDS
BY STEVE ROSENTHAL

A short glossary of terms for use with 'First Aid for Disk Drives,' page 159

13- AND 16-SECTOR DISKS
The first disk-operating systems for the Apple II (DOS 3, then 3.1 and 3.2) had 13 sectors (chunks of data) 256 bytes long on each track. The current DOS 3.3 and ProDOS systems use 16 sectors per track. You can convert many 13-sector disks to 16-sector form, using Apple's MUFFIN program.

16-SECTOR
DOS 3.3 and ProDOS use 16-sector disks, which have 16 chunks of 256 bytes on each track.

35 AND 40 TRACK
The 5¼-inch disk drives Apple sells store data in a pattern of 35 concentric magnetic tracks. Other similar drives put 40 tracks on each disk by using the area close to the center hole. Using more tracks makes more room, but Apple has chosen to stay with 35 tracks for greater reliability and compatibility.

ACCESS TIME
For disk drives, this term has two separate meanings: track-to-track access and average access time. Track-to-track access time is the interval it takes a drive to move the read/write head from a starting position to an adjacent track (for drives used on an Apple, normally a number between two and ten milliseconds). Average access time is the interval it takes, on the average, for the disk drive to read or write on any spot on the disk (normally a number between 20 and 100 milliseconds).

ALIGN
To set a disk drive so that it starts on the outside track (track 0) at the right position and keeps the head at the right distance and angle. A drive that is misaligned often can read its own disks but may not be able to read disks written on any other system.

ANSI DRIVE
A disk drive that conforms to the general industry standard for 5¼-inch drives, instead of being configured specially to work with the Apple II family. You can get kits to convert some brands of ANSI drives to Apple compatibility, and some disk-controller cards for the Apple can read or write with unmodified ANSI drives.

BAND POSITIONER
A type of mechanism that moves the disk read/write head back and forth across the disk surface, using a metal band looped over a pulley driven by a stepper motor. Band-positioner drives can change tracks faster than the screw-type ones but are more expensive and difficult to produce.

DIRECT-DRIVE MOTOR
A disk-drive motor built into the hub rather than driving the hub through a belt-and-pulley arrangement. With no belts to stretch or wear, these drives are more reliable and need less maintenance.

FULL- AND HALF-HEIGHT DRIVES
The original 5¼-inch disk-drive mechanisms were 3¼ inches high, so computers and cases were designed with openings this size. Advancing technology made the design of smaller drives possible; ones half as thick (half-height) are now the most popular.

GCR
An abbreviation for Group Code Recording. Apple chose this method to code data stored on disks. Using GCR allowed Steve Wozniak to design an inexpensive disk controller.

HALF TRACK
Drives for the Apple II family can move their read/write heads to a position halfway between the normal track positions (standard drives cannot). Half-track movements are part of many copy-protection schemes.

LEAD SCREW
(Pronounced "leed screw.") A mechanism that moves the read/write head of the disk drive back and forth by twisting a spiral screw (the lead screw). This is the method the Apple Disk II uses, but newer drives often use the faster band-positioner technology.

QUAD DENSITY
In the Apple world, this term usually refers to drives that use both sides of each disk and pack twice as many tracks on each side (which doubles storage capacity and then redoubles it). Quad-density disks can store somewhere between 500 Kilobytes (500K) and 1 megabyte (1000K) per disk, compared to 143K for the standard Apple disk.

ROTATION SPEED
The number of times the disk turns around each minute. Apple drives are supposed to turn at 300 revolutions per second (RPM) but may need occasional adjustment to keep to this speed.

SECTOR
An arc-shaped section of the magnetic track pattern on a disk, or the data that is recorded in that section. Apple drives store 256 bytes in each sector.

SOFT-SECTORED
Disks on which each individual section of data within a track is marked by a magnetic address pattern, rather than by a physical timing hole in the disk. A single hole marks the start of the track. All Apple products use soft-sectored disks. Because locations are denoted by magnetic patterns, these patterns must first be written on the disk before it can be used, a process called initializing or formatting the disk.

STEPPER
The special motor in the disk drive that moves the read/write heads in and out to each track position, following the computer's instructions.

TRACK
An invisible magnetic circle pattern written onto a disk as a guide for storing and reading information. Standard Apple-II-family disks have 35 of these concentric circles, with track 0 being closest to the outside of the disk.

TRANSFER RATE
The amount of data that can be read from or written to a disk in one second. It is primarily a function of how fast the disk turns and how closely together the bits can be packed on the disk surface. On an Apple Disk II, the transfer rate is 125,000 bits per seconds and something more than three times as fast for the Macintosh (depending on which track), and ten times as fast for a hard disk.

WRITE-ENABLE NOTCH
A small region on the right edge of the floppy-disk jacket that must be left cut open or the disk drive will refuse to write on the disk (on 8-inch drives, the notch is called the write-protect notch, because leaving it open prevents the drive from writing on the disk). You can cover the cutout on disks you want to protect with opaque adhesive tabs. Some system disks do not have cutouts. +

Is there a IIc

Is the enhanced Apple IIe for you?

COVER STORY/BY J. ANTHONY DIRKSEN

Even though it's approaching its eighth birthday, the Apple II is still in many ways the same machine that Wozniak and Jobs pieced together back in the garage.

Certainly, it's seen a lot of changes since then, such as the substitution of Applesoft BASIC for Integer BASIC in the Apple II Plus and the redesign of the motherboard in the Apple IIe.

Apple has made every change in the Apple II carefully, however, with a real concern that each new system works with the systems that preceded it. This approach makes sense. The Apple II has always been Apple's bread-and-butter product. As long as it continues to sell well, any modification in the machine—even if it is a relatively small modification—represents a major move that will affect a lot of people, from developers to users.

So Apple's recent decision to replace four chips in the Apple IIe means a lot more than you may think. It means, for instance, that the Apple IIe will now work a lot more like an Apple IIc does.

The two computers were already pretty close, but developers weren't taking full advantage of the advanced capabilities built into the IIc, preferring instead to write programs for the more generic—and more established—IIe.

The new chips give both machines essentially the

in your IIe?

same capabilities. As part of the enhancement, Apple is installing

- the same microprocessor that's in the Apple IIc—the 65C02—with 27 additional instructions that haven't been available in the brain of the Apple IIe
- a character - generator ROM that allows the Apple IIe to display Mousetext characters (for additional information about Mousetext and mouse-driven software for the Apple II, see "Mouse-Driven Software for Apple II Computers," *A+*, March, pages 38–44)
- two new monitor ROMs that give the Apple IIe better interrupt support

and add a collection of advanced programming features

As of March, every new Apple IIe has these four chips in place of the old ones. Owners of earlier incarnations of the IIe can get them installed at a dealership for about $70. (All installations are made by dealers. You *cannot* take the chips home and install them yourself.)

Should you get the upgrade? Most people will probably want it eventually, simply because most Apple owners like to keep their machines current. In fact, longtime Apple watchers will remember when Apple increased the capacity of the Disk II to 140K several years ago. Virtually everybody seemed to make the

switch overnight.

This time, in contrast, Apple isn't pushing its installed base too hard to upgrade machines right away. The immediate advantages of an enhanced IIe are really useful only for a small number of Apple owners. With the enhanced IIe, you can

- start up ProDOS programs from a ProFile or other hard-disk drive by putting the disk-controller card into slot 7
- type BASIC programs in uppercase and lowercase letters
- use a built-in 6502 miniassembler to assemble machine-language programs. It is essentially the same miniassembler that came in the original Integer BASIC Apple II, but it's been out since the days of the Apple II Plus.

You won't have to keep your Caps Lock key down all the time, and scrolling 80-column text is smoother, but otherwise most of these features won't mean much to most Apple IIe owners. The only actual difference you'll definitely see is that the computer displays Apple IIe when you turn it on, instead of Apple II.

Over the long run, however, Apple expects sales of this enhanced machine—coupled with the growing base of Apple IIc owners—to inspire developers to create a new generation of programs, featuring windows, icons, and pull-down menus, which will allow Apple II software to look and work much like programs do on the Macintosh.

In many ways, however, Apple is admittedly selling futures with these features. None of them will be available until third-party developers or Apple itself writes new software that takes advantage of these tools.

Of Mice and Chickens

Now it's time to introduce that ageless question of the chicken and the egg. Which comes first? Do Apple owners run out and get the upgrade, inspiring developers to write programs that take advantage of these capabilities? Or do developers write new software right away, hoping to create products that inspire Apple IIe owners to have the upgrade done?

This chicken-and-egg scenario (or perhaps it would be more appropriate to call it a cat-and-mouse game) will probably go on for at least a few months, until the number of owners of the Apple IIc and enhanced Apple IIe increases enough to guarantee a large base for developers.

As one developer says, he won't necessarily use those features even then: "Whenever possible, I'll try to write for the largest number of computers that I can. Unless my idea for a program is so complex that it requires these features, I'm not going to use them."

What Do You Give Up?

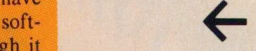
The biggest concern for most current owners is about whether the software they have now will work on the enhanced machine.

Generally, the answer appears to be "yes." Apple says that more than 95% of the popular programs made for the Apple II work without modification on the enhanced Apple IIe, and many of those that don't work are being upgraded for the new machine. (Your dealer's compatibility list includes information about how to get upgraded versions of products.)

The biggest compatibility problem results from the addition of Mousetext in the new character-generator ROM. Mousetext is a set of graphic characters (see sidebar) that a programmer can use to aid in emulating Macintosh software on the Apple II. A programmer can manipulate these characters just as easily as moving letters and numbers around on the screen.

Here's where the problem comes in: Mousetext replaces one of the existing character sets on the Apple II, a flashing set of letters and numbers. (You don't actually lose anything, because it is actually a duplicate character set that developers were discouraged from using all along.) If a program uses that flashing character set, it will display Mousetext characters on the screen instead of the original letters and numbers.

Actually, the program will work in just the same way, but the screen will look different. For instance, instead of seeing a flashing *H* on the screen, you'll see



And instead of seeing @, you'll see

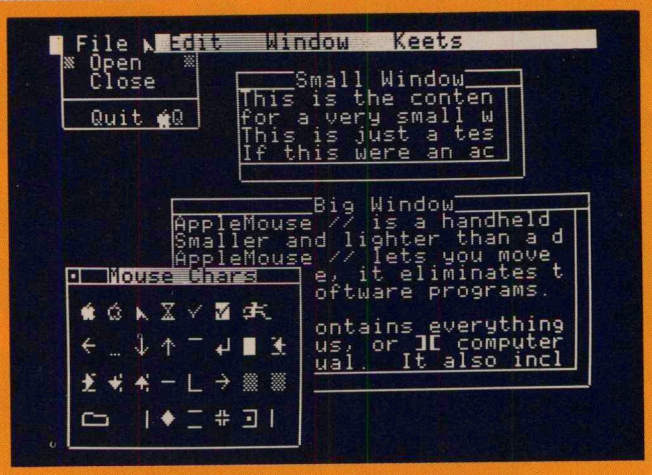
Reading a screen with a bunch of Mousetext characters may seem a bit like translating hieroglyphics, but you should generally still be able to use the program, just as always.

Only a few programs actually use the affected character set. Most of the commercial programs that have a Mousetext problem are detailed in Apple's compatibility guide.

If you're using custom software, however, you should try to check it out on an enhanced system at your dealer's before having your system enhanced. Dealers have agreed with Apple to get rid of the old chips, in order to ensure that they won't show up in bootleg Apples. So, once you have the upgrade done, you may not be able to turn back.

What Do You Get?

When your dealer in-



MOUSETEXT

Look familiar? No, this isn't a Macintosh screen; it's an Apple II with Mac-like features. The Macintosh-style user interface, complete with windows and pull-down menus, is made possible by Mousetext characters. Mousetext is built into every IIc and can be added to the IIe with the upgrade chips described in this article.

Although the current generation of Apple II software does not make use of Mousetext, Apple has been showing developers how to give their Apple II programs some of the Mac's convenient features. Many future Apple II programs will utilize Mousetext to incorporate the mouse, windows, and pull-down menus. Developers hope this innovation will extend the already legendary life span of the Apple II series of computers.

In order to use this new generation of Mac-like software for the II series, you will need either an Apple IIc or an upgraded IIe. So if you have an Apple IIe and want to be ready for the new wave of mouse-driven software, you should seriously consider upgrading your IIe, even though it does mean losing a small amount of compatibility with the current generation of IIe software.

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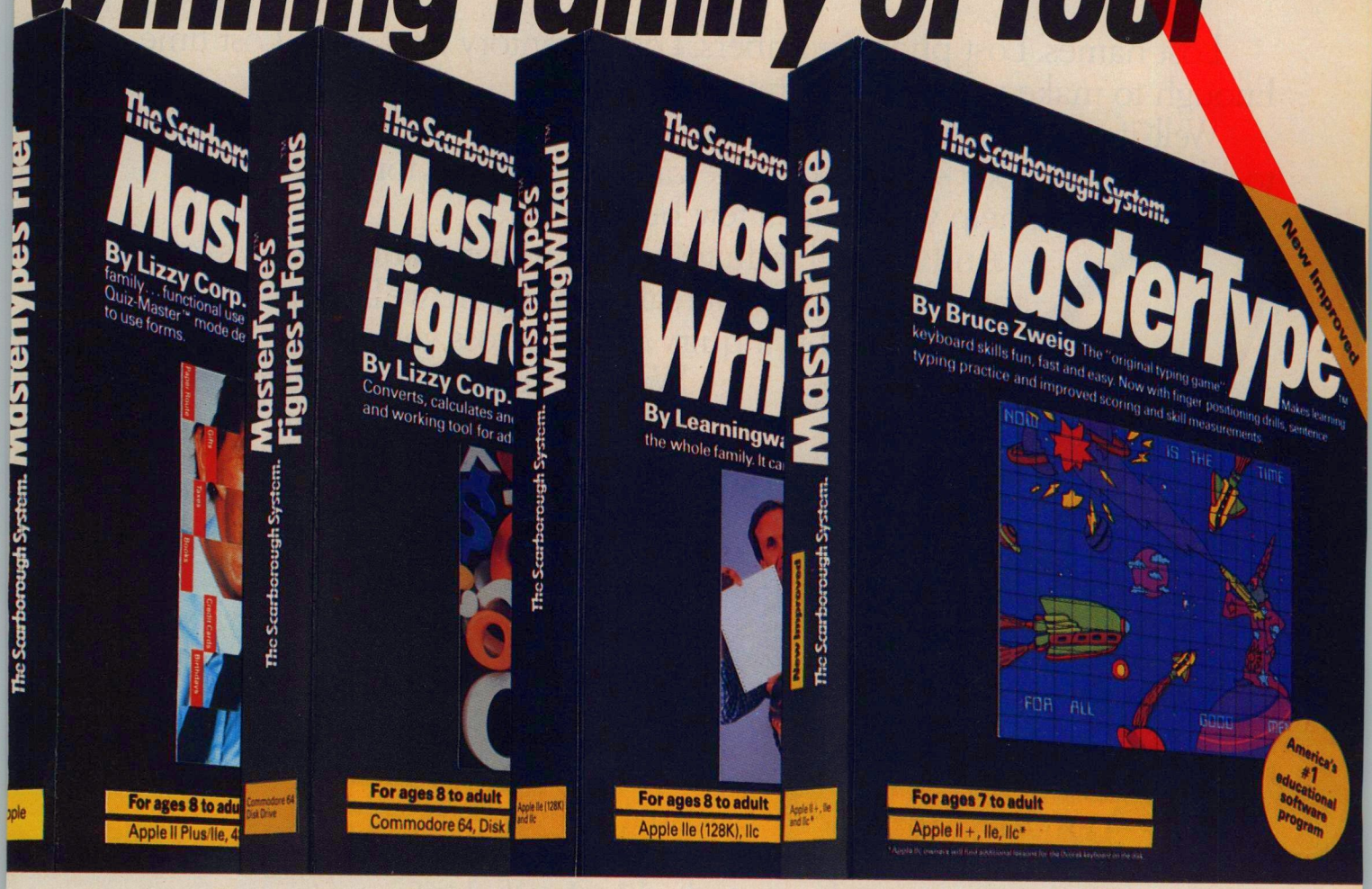

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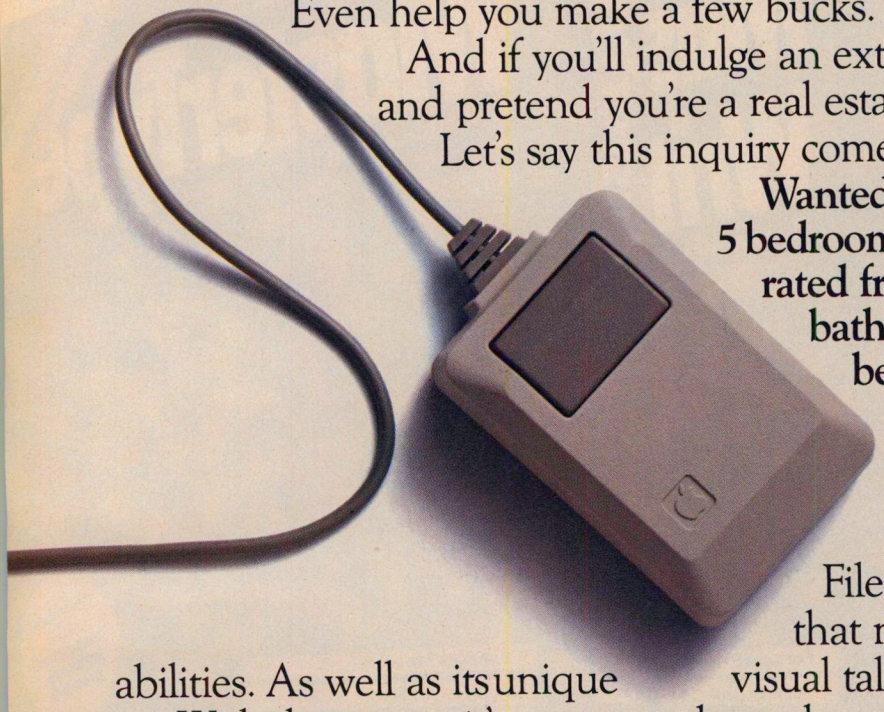

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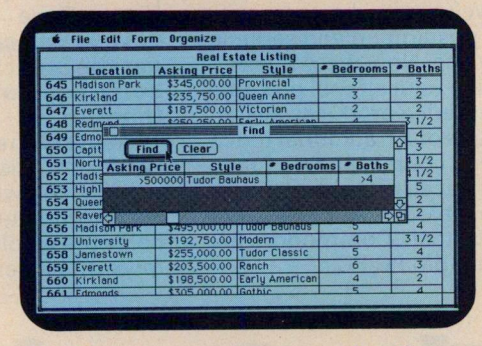

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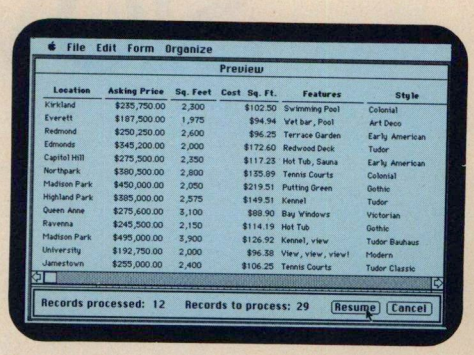

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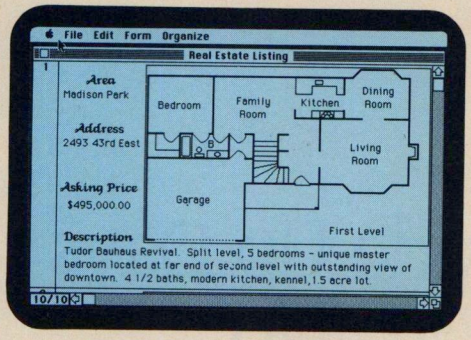

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***The promotion is available only through participating dealers in the U.S. and Canada. Please allow 4 to 6 weeks delivery for rebate check.** Smartmodem 1200 and Smartmodem 1200B are trademarks of Hayes Microcomputer Products, Inc. Macintosh is a trademark of Apple Computer, Inc. IBM is a trademark of International Business Machines Corp. ©1985 Hayes Microcomputer Products, Inc.

CIRCLE 101 ON READER SERVICE CARD

stalls the upgrade, you'll get a short manual describing some of its main features and detailing the differences between your old IIe and the enhanced version of the machine.

You'll also get a sticker that identifies your system as being "enhanced." It fits over the power light next to the open-apple key. Installing this sticker is especially important if your system will be used in a classroom or in another setting that may include both enhanced and unenhanced systems, so anybody can tell which is which.

A programmers' manual is also available at many dealerships, but it's not designed for the weak at heart or for anyone who's not fanatically serious about software. It's full of things such as instruction sets for the 65C02 and listings for the new monitor ROMs. If you don't already know half of that stuff, you probably do not even want to ask for it.

If you're buying a new system, you won't get the aforementioned upgrade, but you will get a new tutorial disk and owners' manual, both of which have as their model the excellent start-from-scratch tutorials that accompany the Apple IIc.

To Enhance or Not to Enhance

Apple is advising customers to have the enhancement done "when a program you want that requires it becomes available."

For most people, that advice is reasonable. The software that's coming may be pretty fantastic, using double-high-resolution graphics to create striking on-screen displays, as well as taking advantage of some of the easy-to-use features of Apple's newer systems.

It's probably safe to assume that this new software will also require 128K of memory and a mouse, though. If your funds are limited, you may want to invest now in a memory or mouse upgrade (since you can start taking advantage of either of these improvements right away), and wait to get the system enhancement until the arrival of products that actually need it.

Don't get your hopes up too high. Even though these Mac-like programs may be impressive on an Apple II, they will almost definitely still lack the total integrated design of some software designed for one of Apple's 32-bit machines. You probably won't be able to cut and paste between a Mac-Paint-like program and a word-processing program, for instance—at least not right away.

What's to Come

There's no telling where developers might take this technology two or three years from now. Clearly, Apple has established a direction for the Apple II that follows the line the Lisa and Macintosh have established.

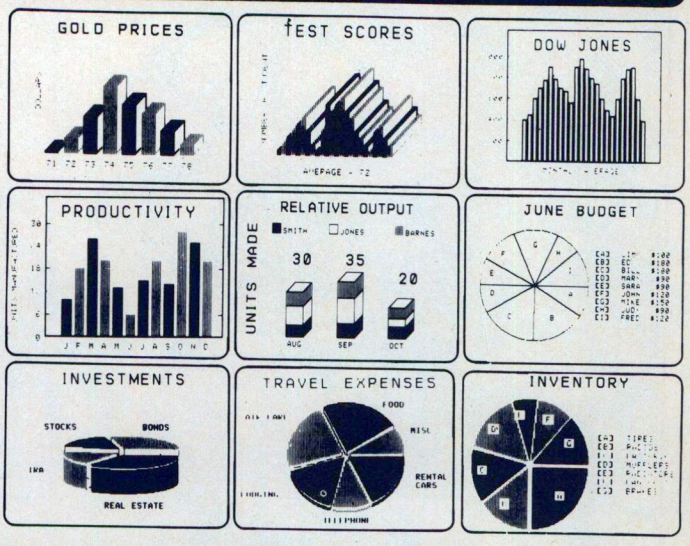
It's a compelling way to go, especially since Macintosh-style programs allow average people to dig right in, without having to plow through a manual.

Now Apple II owners can take advantage of that new-style software, as well as the who-knows-how-many thousands of regular-style programs that also work with the machine.

After eight years of growth, changes, and advances, the enhanced Apple IIe is still in many ways the same computer it's always been. A lot of developers are still fans of the machine, which bodes well for the success of the enhancement and for the continued success of the Apple II. ✚

J. Anthony Dirksen is a free-lance writer based in Silicon Valley. He has not yet been enhanced.

MasterChart!



Don't pay more for less! The pictures shown above are examples of charts created with MasterChart!, perhaps the most powerful and friendly Apple II chart program on the market. Within seconds, keyboard-entered data can be converted into picture-perfect pie or bar charts, in 26 user-selectable styles, automatically scaled and labelled, and in color or black and white. And if you want to customize your charts by adding extra artwork or text, or display them in a slide show, MasterChart! comes with these valuable extras.....

A **slide projector,** for orchestrating automated, stand-alone screen presentations of a series of charts, timed and sequenced by the user. This program alone is worth the cost of the disk. It can be used with any graphics files created with any program.

A **graphics editor,** for alteration and embellishment of charts. Besides standard point-by-point sketching, built-in structures permit push-button creation of cirlces, rectangles, lines, shape-table shapes, and exotic woven plaid patterns. If you wish to add clarifying text to the charts, you may type on the screen in several different letter font styles. For the artist, the graphics editor can also be used to sketch any imaginable scene from scratch.

A **shape table editor,** for creating special shapes for your charts. These shapes can also be used for animation in your programs! A sample animation program shows how to do it.

MasterChart! includes a screen-dump program for printing your charts on paper. MasterChart! is more! Just read what these people have to say about it...

"I noticed the advertisements for Spectral Graphics' Master Chart! program and figured that, with a money-back guarantee, I would try it. Boy, am I glad I did! This is a fantastic program. You can master its many varied capabilities in less time that it would take to describe them. I would recommend it to everyone, even if you have absolutely no need for a graphing program. It's just fun to play with." **S.A. Smith, San Bernadino, Calif... letter to SOFTALK, June, 1984, page 14.**

"The software does much more than the advertisement suggests. Without question, this is among the best buys in software that I have ever come across, and certainly among the best written. It is extraordinarily easy to use, very well thought out, and priced to kill your competition (which I wish you every success in doing)." **Anthony J. Scriffignano, North Caldwell, New Jersey.**

"I have long been distressed by the lack of software available in the scientificlacademic community. At last there is a simple yet robust graphics program applicable for our purposes: MasterChart!, by Spectral Graphics Software. Business folks and scientists alike will really appreciate how user-friendly it is; I was able to produce my first three-dimensional, multi-colored, labeled bar graph within five minutes of booting the disk--without reading my documentation. I would have had to pay a scientific illustrator much more than the whole program costs just to produce that one graph....you can't do without this gem." **John B. Iverson, Richmond, Indiana...letter to SOFTALK, April, 1984, page 23.**

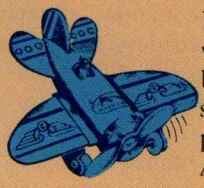
ONLY $29.95 Apple II+/IIe/IIc. Satisfaction guarantee or your money back (really!). Send a check or purchase order to **SPECTRAL GRAPHICS SOFTWARE,** 6333 Pacific Avenue, Suite 256, Stockton, California 95207. Or call (209) 463-7309 for COD orders and dealer inquires. MasterChart! is not yet sold in most stores. All orders are shipped immediately and are in your hands within three days.

CIRCLE 464 ON READER SERVICE CARD

JOHN CRAIG

SOFTWARE FOR BUDDING YOUNG WRITERS

STORY MAKERS CAN HELP YOUNGSTERS BLOSSOM



Now that the software developers have become expert at designing educational programs for your Apple that hone such mechanical skills as mathematics and spelling proficiency, they've taken on a far tougher challenge: developing software that helps children write stories.

Creative thinking is a prerequisite for any good tale. Ideally, then, a first-class "story maker" should develop this ability in young writers. The hitch is that creativity, unlike multiplication, isn't something that's easily taught and measured. That's why it's a lot trickier to design an effective story maker than it is to create electronic flash cards and why, at this early stage, it's difficult to determine whether story makers will cause latent Hemingways to blossom any sooner.

FOUR DIFFERENT APPROACHES

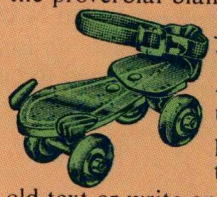
Currently, at least four story makers are available for the Apple II family of computers, each embodying a different approach to using a computer for creative writing. In fact, the only feature the various story makers share is that they all include basic word-processing capabilities.

After you try out several story makers, some key parameters for evaluating them emerge. At the most basic level, a story maker should be easy enough to use to prevent clammering for pad and paper, and fun enough to stave off a beeline for the television set. The other consideration—and one that is far more difficult to characterize—is whether the story maker triggers those unconscious, intuitive hunches that form the basis of creative thought.

It turns out that the two most straightforward story makers have the same straightforward name: Story Maker. One is published by Scholastic, Inc., the other by Sierra On-Line, Inc.

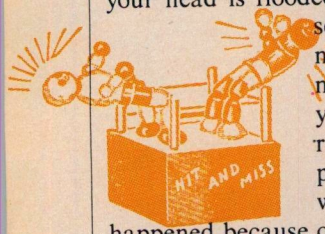
Words and Picture Gallery

Scholastic's Story Maker helps children create picture books. The screen is the proverbial blank page; the author's job is to fill it with words and pictures. Authors create text using a simple word processor that lets them back up over old text or write on top of existing text. They can illustrate their work either by creating pictures freehand—using mouse, joystick, or KoalaPad—or by selecting pictures from the Picture Gallery, a collection of more than 50 images that run the gamut from snakes to motorcyclists.



In addition to coming to the rescue of less artistically inclined authors, the

Picture Gallery is a great tool for piquing the imagination. Suppose, for example, that you're writing a story about a pig. You're vague about how the plot will unravel, but you plough in anyway—writing a sentence or two to introduce your hero and then drawing his portrait, using your mouse. Next, you decide to add some scenery to the opening page, so you select the Picture Gallery. Scanning the images, your eye is drawn to the cactus. Quite suddenly, your head is flooded with the tingling sensations that signal the birth of a new idea. At last, your story has a direction: the tale of a pig in a mudless world. And it all happened because of that cactus.



Story Maker is filled with fun features: 8 different type styles and 16 different pen colors to choose from, stamping capabilities that let authors display multiple images of the same graphic on a page, and an eraser controlled by the mouse or another input device that makes it easy to change direction in midpicture. The software's only real limitation is that the editor doesn't have word wrap, so it's easy to get caught with part of a word on one line and the other part on the next.

Words and Graphics Tools

Story Maker by Sierra On-Line also provides tools for budding authors. The basic idea is the same: creating stories, using words and pictures. Sierra's rendition doesn't let authors draw and write on the same screen, though. Rather, selecting one option invokes a drawing screen, and selecting another invokes a screen for writing. The software knows which picture to insert where because authors insert picture names in the appropriate spots in their text. When authors read their stories, pictures appear on the top portion of the screen and words on the bottom. This arrangement looks neat and tidy, but the implementation is cumbersome.

Sierra's Story Maker has nothing resembling a picture gallery, but it does provide a variety of graphics tools—including functions that draw lines, circles, and squares—and a selection of 14 colored patterns for filling in shapes. For drawing, users may either use an input device such as a mouse, joystick, or touch tablet, or they may use the I, J, K, and M keys, although these keys can only be used to draw lines, not circles and squares.

A major limitation of Sierra's Story Maker is that it doesn't have printing capabilities. This drawback may not be a liability in a generation or two, but many children today are still hooked on the pleasure of reading their stories before bed or bringing their work to school to share with classmates—activities that aren't easy to pull off when printed copies aren't available.

Writing As Play

Woodbury's Play Writer Series takes quite a different approach to writing. First of all, it has nothing to do with writing plays. Rather, the title of the series is based on the idea that the software lets a child play at being a writer. Once you understand that, everything starts making a lot more sense. Four different Play Writer packages are available including Adventures in Space, Tales of Me, Mystery!, and Castles and Creatures.

Play Writer authors don't exactly write their own stories. Rather, they answer a series of questions. The Play Writer software then uses the responses to those questions to compose a story. For example, in Adventures in Space, the software begins by asking users questions such as the name, sex, and age of the hero and the hero's favorite planet and galaxy. Play Writer then responds with a story that starts something like this:

> For Wanda Bradley, it was a very special day. While everyone else was getting up for school or work, she was preparing for something a little different, a journey through uncharted space . . . You see, Wanda had read in the newspaper that NASA was planning a mission to Lunar Lotus, which happened to be Wanda's favorite planet in the Lunar Kingdom galaxy . . .

Once the software has done its work, authors have the option of editing the computer-generated tale.

Each of the Play Writer packages includes all the supplies an author needs to produce a finished book: hardcover book jacket printed with the title of the Play Writer package, paper for pages of the book, and endpapers for attaching paper to the book jacket.

The Play Writer software has no graphics capabilities. Instead, the package includes stickers that are relevant to the subject—an assortment of space creatures for Adventures in Space, for example. The idea is that after printing the final version of their tale, authors affix the stickers in appropriate places in the text.

Authors who have completed one book can purchase refill packs that include stickers, endpapers, printer paper, and hardcover book jacket.

Branching Out

Although Play Writer lets the computer take over much of the writing process, Story Tree—another story maker by Scholastic—takes the opposite tack. It asks authors not only to create original tales but also to design those tales with enough twists or branches to send Sherlock Holmes into a tailspin. The final outcome is interactive stories in which readers make choices about how the story will unfold.

Suppose, for example, that you wanted to write a story about a magic tunnel. Using Story Tree, you could construct the story so that when readers came to the portion of the story where the tunnel divides, they would be asked to choose either the left or right fork. Choosing the right fork would lead them to a Roman bath, and choosing the left would deliver them to the Leaning Tower of Pisa. Lest a story become predictable through repeat readings, the software lets authors invoke a Chance option that randomly chooses among different alternatives. In one reading, for example, the right fork might lead to the Roman bath; in another it would descend upon the Queen of Sheba's palace.

As you might suspect, Story Tree authors must keep careful track of where their stories are headed. To do this, the Story Tree manual suggests that authors create a story map—a diagram resembling a flowchart that includes each screen of information an author writes, the options a reader may select from each screen, and where each of those options goes.

The branching capabilities of Story Tree also let authors write nonfiction articles in which readers can select to read about the aspects of a subject they're most interested in.

THE STORY MAKER FOR YOU

Once you're familiar with how various story makers work, the obvious next step is deciding whether they'd enhance your software library. A good place for you to start is to determine if

Announcing: The Original Boston Computer Diet.™

J.L. Read MD, C.A. Carlin MS, RD, I. Greenberg PhD, G.L. Blackburn MD, PhD, of Nutritional Management Inc. are available to counsel you personally on weight loss, in your home or office.

This is a new, powerful, revolutionary program – springing from nutritional and medical science and grounded in human psychology – that creates an individualized, personalized program to help you look and feel better for the rest of your life.

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First, it takes into consideration your physical fitness, weight history and eating habits as well as your attitudes and feelings about weight control.

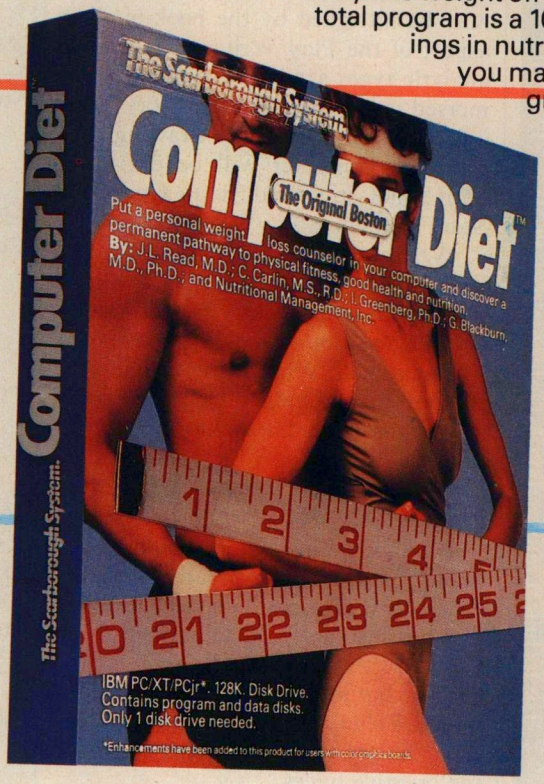
Working with these factors, you and your Original Boston Computer Diet counselor create personalized, easy-to-do, easy-to-follow meal plans that are specifically tailored to your needs. You can actually choose one of three computer counselors, the one whose personality best meshes with yours, to aid you, to supervise your diet and help you progress.

Rather than relying on will power, The Original Boston Computer Diet helps you build a new, totally positive attitude toward weight control. In essence you replace the habit of overeating with the habit of controlled, sensible eating.

At the finish of the program you and your counselor develop a maintenance diet that helps *keep* the weight off once you've lost it. Included in the total program is a 100-page book of suggested readings in nutrition and weight control, to help you maintain fitness. Complete with graphics and animation, The Original Boston Computer Diet is available for IBM, Apple and Commodore computers, so you can use it at home and/or at the office. At tops, it takes just an hour or less of your time per week.

This is not a fad diet or crash diet. It's a medically and psychologically tailored program, which contains a data base of over 90% of the foods most Americans eat, and to which you can add special favorites of your own.

Its purpose: to help you lose weight and look and feel better, for the rest of your life.



Available for:
IBM PC/XT/PCjr
Apple IIe/IIc
Commodore 64/128 coming soon.

The Scarborough System.

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Macintosh & Apple

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F-15 Strike Eagle	34.95	27.95
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CIRCLE 125 ON READER SERVICE CARD

these packages facilitate the mechanical aspects of writing. If your child feels comfortable composing at a keyboard, the answer is probably *yes*, if only because each of the programs includes a word-processing function. Prospective buyers should know, however, that even simple word-processing programs such as Bank Street Writer include far more functions than the insert/delete variety of editor found in the story makers reviewed here.

Of all the packages discussed, Scholastic's Story Maker is definitely the easiest to use; and, consequently, it is most appropriate for children in the early elementary grades. This age group could also use Sierra's Story Maker, although the lack of integration of text and graphics makes it harder for small children to handle independently. Because Story Tree and Play Maker are word-oriented rather than picture-oriented, these programs are best suited for children who are at least in fourth or fifth grade.

The answer to another pertinent question—Are these packages fun?—depends on the personal likes and interests of individual children. Children who are crafts-oriented, for example, may be intrigued by the book-binding aspect of the Play Writer series; more analytic types are likely to become immersed in the intricacies of Story Tree; and children who enjoy drawing pictures via computer will be drawn to both Scholastic's and Sierra On-Line's Story Makers.

Whether story makers boost creativity is a tougher issue. Although fun to play with, the Play Writer series doesn't do a lot to loosen up cramped imaginations. What's more likely is that after watching a computer program spin an entertaining yarn, children will wonder why their teachers are so insistent that students write their own tales.

Sierra On-Line's Story Maker is just about neutral in the creativity realm. Basically it gives authors some drawing and writing tools and tells them to go for it. Active minds will jump at the chance, but lethargic ones still may not budge. Scholastic's Story Maker's Picture Gallery definitely helps shake up the creative juices.

Story Tree is an odd bird. It certainly encourages authors to come up with numerous twists and turns in their tales, an act that requires imagination aplenty. The process, however, demands such attention to logic and detail that it causes authors to forfeit the spontaneity that normally is a prerequisite to creative thinking.

No matter how you look at it, writing, especially creative writing, is a complex, almost mystical activity. Given our minimal knowledge of creativity and the relationship between language and creativity, it is naive to expect software developers to come up with surefire methods of making children more creative writers. The products reviewed here are a beginning. Whether, in the end, they do much more than ye olde pencil and paper is up to children, parents, and teachers to decide. ✚

Elizabeth Weal is a San Francisco Bay Area writer who divides her time between writing about computers and writing about the world.

▶ PRODUCT INFORMATION

Story Maker
Scholastic, Inc.
2931 East McCarty Street
P.O. Box 7502
Jefferson City, MO 65102
(314) 636-5271
List Price: $95
Requires: Apple II Plus, IIe, or IIc; 64K RAM; one disk drive; AppleMouse, joystick, or KoalaPad
CIRCLE 510 ON READER SERVICE CARD

Story Maker
Sierra On-Line, Inc.
Coarsegold, CA 93614
(209) 683-6858
List Price: $34.95
Requires: Apple II, II Plus, IIe, or IIc; 48K RAM, one disk drive; AppleMouse, joystick, or touch tablet recommended
CIRCLE 511 ON READER SERVICE CARD

Play Writer
Woodbury Software
127 White Oak Lane
Old Bridge, NJ 08857
(201) 679-0200
List Price: $39.95 each for Adventures in Space, Tales of Me, Mystery!, and Castles and Creatures
Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive
CIRCLE 512 ON READER SERVICE CARD

Story Tree
Scholastic, Inc.
2931 East McCarty Street
P.O. Box 7502
Jefferson City, MO 65102
(314) 636-5271
List Price: $59.95
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive
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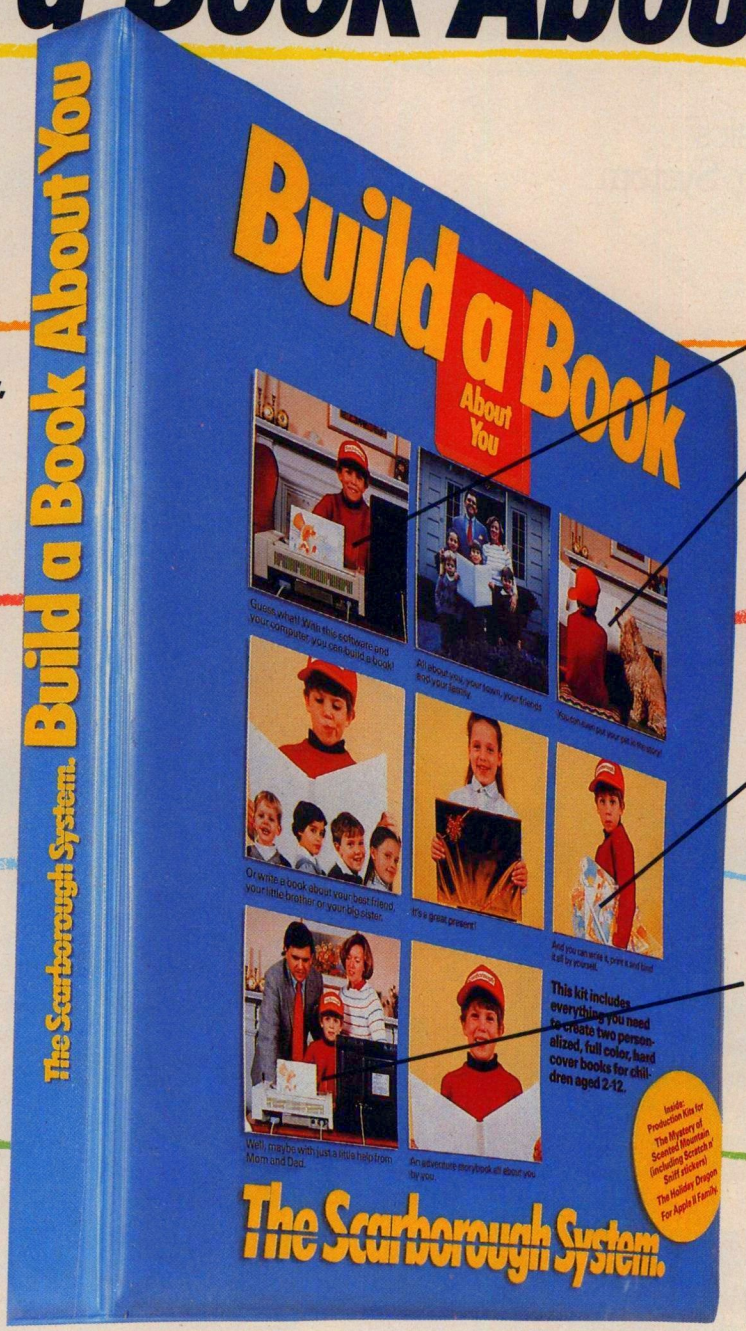
Build a Book About You with Build a Book About You.



Parents,
There's nothing else like Build a Book About You! You and your child can create two personalized storybooks, all about your child, neighborhood, friends, family, pets. And it's a great gift, too.

Build a Book About You includes everything you need to print out two stories on full-color pages and bind them in durable covers just like real illustrated children's books. But there are four stories on every disk. So with additional supplies, now available at your store, you can use your disk to build more books. Reuse the disk over and over!

This software works on all popular printers and the program is so simple even kids can use it to build their own books! Books about themselves; sure to strengthen reading skills because kids will want to read them again and again.

Build a Book About You is a project you and your child can work on together, one your whole family will enjoy.

Kids,
Here's how easy and fun it is:

1. Take out the disk and put it in your computer.

2. The computer asks you some easy questions. How old are you? Where do you live? What's your best friend's name? You can answer those, right? Mom and Dad might want to help you type the answers.

3. Then take the pages of the storybook — have you got them? Ask Mom or Dad to help you load them in the printer.

4. Press the button and watch your book print out. Wow! There's your name! This book is about you!

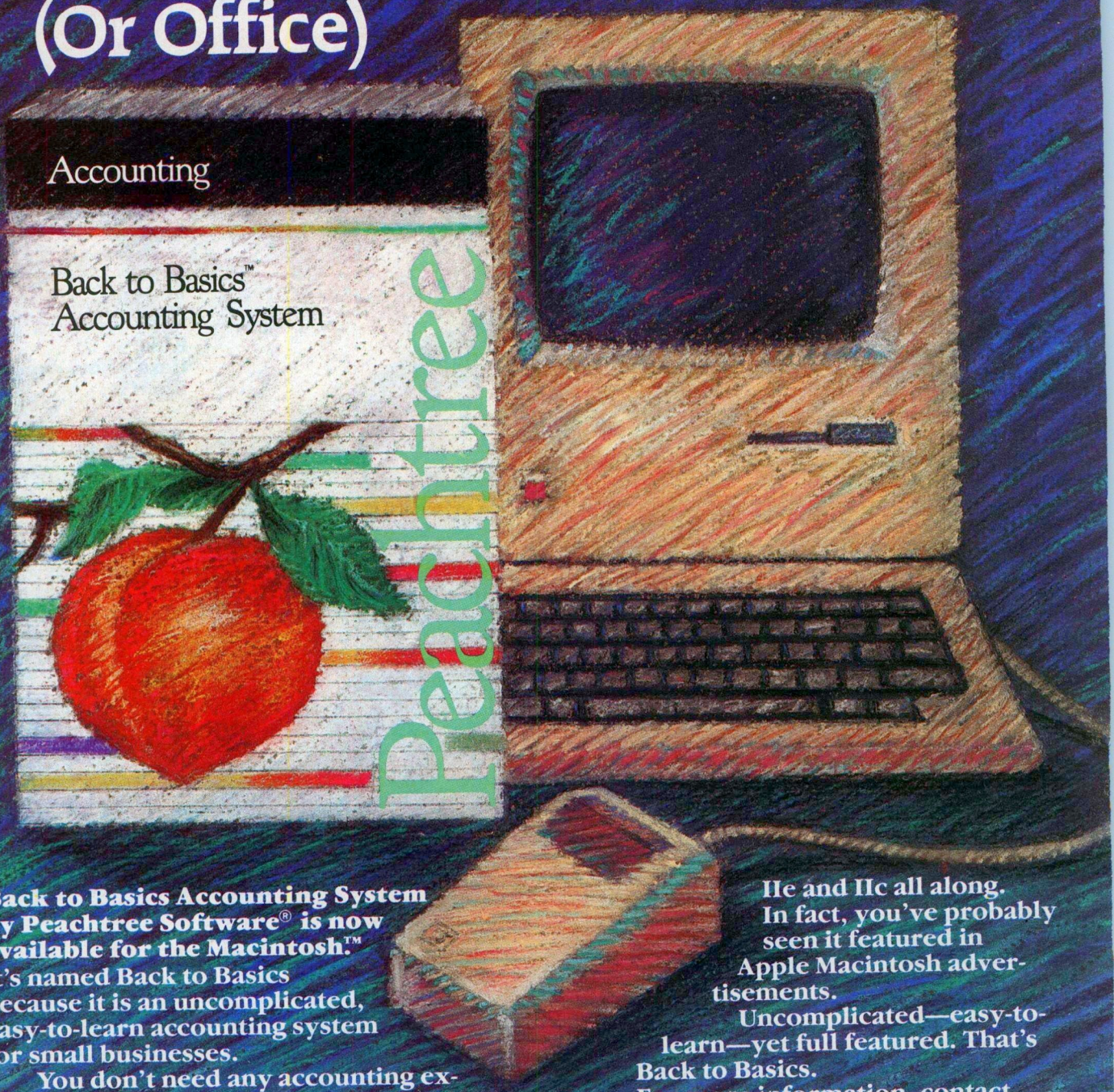
Available for:
Apple II+/IIe/IIc
IBM PC/XT/PCjr
Commodore 64/128
and all popular printers.

The Scarborough System.

55 South Broadway, Tarrytown, N.Y. 10591

CIRCLE 206 ON READER SERVICE CARD

Introducing Accounting For Those With A Mouse In The House. (Or Office)



Back to Basics Accounting System by Peachtree Software® is now available for the Macintosh.™
It's named Back to Basics because it is an uncomplicated, easy-to-learn accounting system for small businesses.

You don't need any accounting experience and barely need any computing experience. The straightforward manual teaches both accounting and computing at the same time.

But make no mistake. This is a full-featured series of interactive products including General Ledger, Accounts Payable and Accounts Receivable.

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Uncomplicated—easy-to-learn—yet full featured. That's Back to Basics.

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CIRCLE 318 ON READER SERVICE CARD

AST'S MULTI I/O CARD

COMPACT, CAPABLE, AND COST-EFFECTIVE

Getting the most from your Apple IIe computer can be an expensive undertaking. Adding an accessory such as a printer or modem usually means installing an expansion card as well. With so many of these cards priced well above $100, it isn't long before the costs start adding up.

The Multi I/O, from AST Research, Inc., is a single expansion card that does the job of three separate devices, yet costs much less. Placing several functions on one card keeps both cost and power consumption to a minimum. In addition, compatibility among the various functions is assured—something that cannot be taken for granted when you mix and match accessories. AST included three of the most popular options in its Multi I/O card—a serial-printer port, a serial-communications port, and a versatile clock/calendar.

With all of its abilities, the Multi I/O card is a compact device that measures just eight inches overall. It installs easily and is well made. The unit comes complete with two RS-232-style connectors that attach to openings at the rear of the computer's cabinet. Short lengths of ribbon cable lead from these connectors to plugs on the card itself, enabling it to communicate with the outside world.

Slot Mapping

A technique known as slot mapping allows the Multi I/O card to occupy just a single slot, yet perform as three separate cards. A set of programmable jumpers on the surface of the card allows you to select where you wish to "map" each of its functions. If you move these jumpers from one location on the card to another, the corresponding functions move from slot to slot. For example, if you install the card in slot 1 (the most common location), you can program it to provide its printer output through either slot 1 or slot 2, send communications data through slot 2 or slot 3, and have the clock function behave as though it were in either slot 4 or slot 7.

When you assign a function to a slot, you can use no other card in that position. Since the slot assignments are easily changed, it is possible to use the Multi I/O card with almost any other accessory. You can install the Multi I/O card in any one of the slots to which its functions are assigned.

It's possible to disable any of the card's three functions if they are not needed or if their operations would conflict with another device. One problem could occur if you mapped the card's communications function to slot 3, since that slot is tied internally to the IIe's auxiliary slot (usually used with 80-column-video-display adapters).

Serial-Printer Output

Printer output from the Multi I/O card comes through a standard serial port, which works with a number of popular printers. The Apple Imagewriter, Brother HR-25 Serial, and Okidata 82A are just a few of the machines that use this type of interface.

Transmission rate is set with the aid of switches mounted on the card. Any speed from 50 to 19,200 bps can be programmed in, but 9600 bps is the most common choice. The data length, stop bits, and parity are under software control and may be changed from within a BASIC or assembly-language program. The default setting is eight data bits with two stop bits and no parity.

I connected the Multi I/O card to an Apple Imagewriter printer, using the cable supplied in Apple's Imagewriter Accessory Kit. After I set the configuration switches on the Imagewriter to match the settings used by the Multi I/O card, the printer worked well and performed smoothly. A graphics print utility is included in the card's software package, allowing the Imagewriter (or compatible printer) to reproduce graphics screens as hard copy.

Communications Port

The RS-232 asynchronous serial communications port serves two functions. It allows you to connect your Apple to an external modem and also lets you use your computer with (or as) a remote terminal. As with the printer output, the communications port can operate at 50–19,200 bps and can use several different data settings.

On-board firmware permits you to switch the communications function into either Terminal or Nonterminal operating modes. When operating as a terminal, the computer behaves as though its CPU were disconnected.

What every Apple owner should know about

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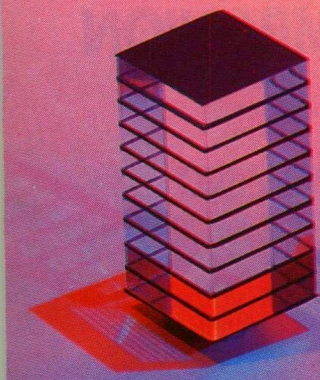

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and prints text files. The disk also includes a tutorial section, which is nothing more than a few pages of text that the manual should have included.

Documentation

The sparse, 30-page booklet that comes with the Multi I/O card is a real disappointment. It describes most of the card's functions in the fewest possible words and provides very little information for serious programmers. The section devoted to installation and configuration is clear, but even a casual user will find the manual far from helpful when it comes to using the card and its software utilities effectively.

Nowhere does the manual even mention how to read the current year from the calendar, yet several of the utility programs display the year on-screen. The few times I consulted the manual for help in operation or setup, I was simply left in the dark.

AST also includes a listing of hardware and software that is known to be compatible with the Multi I/O card. The list that came with the evaluation unit bore the date October 22, 1984, and listed 15 hardware products and 25 software titles.

Cost-Effectiveness

Even though AST's Multi I/O card does the job of several different devices, it is not necessarily a better value than a single expansion device purchased separately. If you are planning to add only a serial printer, clock, or communications device (or if you plan to use a parallel printer in your system), the Multi I/O card may not be the most cost-effective approach.

If you have definite plans to add a serial printer as well as a clock, however, the Multi I/O card starts to make sense. Should you have all three devices in mind—printer, clock, and external modem—the $229 retail price of the card makes it a clear value. ✚

Chuck Doherty is an independent computer consultant and free-lance writer from South Dartmouth, Massachusetts. His work regularly appears in several computer and audio publications.

▶ PRODUCT INFORMATION

Multi I/O
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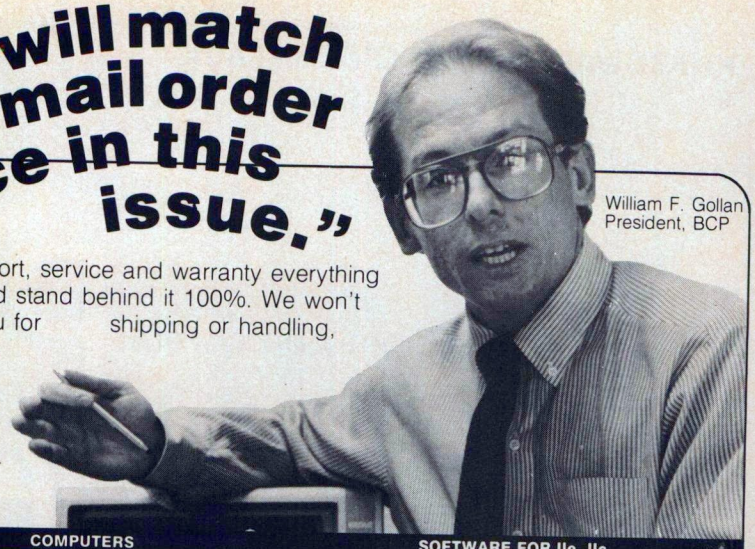

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In Walt Disney's *Fantasia* on the big screen, I saw Mickey Mouse realize one of my fondest dreams. Through the power of the Sorcerer's magic wand, he could make swirling patterns of brilliant color explode in the air with just a wave of his hand.

Computer graphics is the next best thing to sorcery. We can express our visual imagination on the monitor's screen and print out images to share with others. Diagrams, charts, and illustrations for business, educational, and technical applications are only some of the practical uses for this "electric ink."

Inside the Electronic Studio

Let's go from that famous mouse to the magic wand itself. Why, it's just like a light pen! Light pens are one of several control devices used in computer graphics. Others include touch screens, digitizing tablets, joysticks, keyboards, and mice. In combination with software, they provide the resources to draw, draft, write, paint, texture, move, modify, copy, and save pictures—in monochrome and in color—with vivid precision.

You hold a light pen just as a traditional artist grips a pencil or a brush, and the screen becomes a working surface like a painter's canvas. Light pens are more contact-oriented, and they appeal to people who want to confront the image directly with as little command language as possible.

The position of the light pen on the screen is sensed by a net of crisscrossing electrical signals that are part of the cathode-ray-tube system of the monitor. A long wire connects the pen to a graphics card installed in one of the slots of the Apple's motherboard. The software translates the x,y coordinates of the pen's location and your commands to make the program go to work—or play—for you.

DAVID BISHOP

Gibson Light Pen System

Koala Technologies has bundled Steve Gibson's light pen as a low-cost package of four programs. One disk contains Penpainter, a color-graphics illustrator, and two stand-alone monochrome programs, Penanimator and Penmusician. Pendesigner, a more precise monochrome drawing program, is on the second disk. For experienced Applesoft programmers with an interest in graphics, the machine language Pentrak is included as well. Installation of the card in an Apple IIe took me less than ten minutes, and the documentation was clear and well illustrated, although it had neither a Help section nor an index.

To calibrate the program, you point the pen at two lines on the title screen, and, with a couple of buzzes and beeps, you're in. Throughout the Gibson programs, on-screen dialogue accompanies every operation. It's like having R2-D2 kibitzing at your elbow. All of the programs are menu-driven, with some keyboard commands. Penpainter's response is immediate, and pressing the space bar on the keyboard confirms commands. It can stop, start, stretch, or drag objects at which you point the pen. An options bar across the top of the screen lists the four main pull-down menus, which can hide after you've made your choice or remain open while you work. The cursor—that floating white square that is the "point" of your pen—can be enhanced with cross hairs. The Inertia option can adjust the rate at which the cursor follows the pen, for responsiveness in freehand drawing.

The Pens menu has all the drawing, text, and fill options in the form of icons. From this palette you can draw free-form lines and create hollow or filled rectangles, shadowed rectangles, triangles, parallelograms, and circles. There is only one line width, and the text is available in one font, uppercase only. The Colors menu lets you choose from the three basic colors of the high-resolution Apple system, plus white and black.

To erase, you can take out the whole screen by invoking the Clear option or delete details by making the line the same color as the element to be erased, going over it with the pen. But there is no Undo option, which always makes a budding artist more cautious. When making rectangles and other shapes, you can change your mind before confirming the final points. Shake the pen

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until you hear a z-z-z-o-i-p-p sound, and away it goes.

The Mirror option can create bilateral symmetry on four axes, quickly creating strong abstractions. The Pattern and Filling options are effective, if sometimes tricky. You can fill only hollow, black-and-white objects. Since you can't "undo," you would be wise to save pictures before filling. To erase a file, you must bring in DOS. With the Print Pic option, the six printer-interface cards that the Gibson accepts appear in submenus with the choices for each. I used a Grappler+ from Orange Micro with fine results, printing black-and-white images with bold, 90° rotation and small-scale options.

Pendesigner

This program is more of an electronic drafting board than a paint box, trading color for more precision and control. The menu options are all on one panel, appearing and hiding at a tap of the space bar. Confirming points are commanded from the 1 and 2, or < and > keys. Press the Z key, and you zoom in on a chosen area where you can draw—and erase—pixel by pixel, with either the pen or the I, J, K, and M keys. While in the Zoom mode, you can pan across the image.

A handy subfile of "index cards" contains a series of scrapbook images that you can call up at any time in a window. You can use Koala's sample cards, such as Electronics and Floor Plan, or create your own. The frame is another windowing function that permits you to copy or move elements and to shrink or stretch part of an image, erase, or wipe clear a screen area. Pendesigner and Penpainter can interchange files. This ability enables you to paint a picture that was drawn in Pendesigner, but porting them back and forth is cumbersome and time-consuming, as they must be rebooted each time.

Penanimator and Penmusician

Penanimator packs an entire animation workshop within one small program. Its snappy Auto Demo illustrates the mechanics of movement through a 20-frame storyboard. The space-bar command brings you back and forth between the storyboard and the Full-Frame mode, where you can draw (slowly) with its large pixels. The forward and reverse commands encourage you to flip back and forth within a sequence just like movie cartoonists do.

Penmusician can help you learn to read music and compose. It displays three musical staffs, with a string of whole notes through each. The menu bar above provides note and rest options, with sharps, flats, and naturals. All these elements can be dragged into position by the pen and confirmed by the space bar, and they respond with the proper tones. As with Penanimator, you can choose where the playback action begins and ends, and you can save your favorite hits. These programs do not interact with one another, but they are valuable bonuses in an already low-priced package.

> Pendesigner is more of an electronic drafting board than a paint box, trading color for more precision and control.

The Magellan Light Pen System II

The Magellan is a CAD (computer-assisted-design) system targeted for use by architects, engineers, and designers. Because it was originally released as a game-port-controlled program, it was necessary for us to use this updated, interim version without the many options that were "yet to come." The experience was not unlike reviewing high-quality Swiss cheese. Documentation was adequate, and Magellan supports a generous user-update policy. Programmers will be interested in the system's powerful Amper-Pen language. Magellan's Quick-Draw is similar to Pendesigner, with these additional features: The light pen itself has a command button, as do most professional CAD systems. A Widen option thickens lines preparatory to filling. The cursor has three forms, with increasing transparency for accurate detailing. You can use the horizontal and vertical cursor locks—which support drafting modes—like an architect's parallel rule. Text is available from a catalog of fonts, cases, and sizes, including a font/shape editor.

Magellan's Rectangle option is close to a true graphics windowing system. You can draw a window quickly with the pen and then expand or contract it with pixel-by-pixel keyboard commands. Like Gibson's, the Magellan pen can erase the enclosed area, copy, stretch, stripe, and repeat an image. It

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can also negate the area and perform flips and rotations. These options are important timesavers. Compared to many other CAD systems, the Magellan—once it is complete—will be a good value for the features it can provide.

Pen Pointers

Some of the trade-offs in consumer-priced light-pen systems are that they are much shakier and less precise than the professional CAD systems supported by mainframes, minis, and high-end PCs. I found both the Gibson and the Magellan creatively responsive, but far too "sticky" and "slippery." Some functions would stick annoyingly, not releasing when commanded. The cursors would often slip, falling behind the motion of the pen. Options such as Gibson's Circle and Copy often shuddered and shimmied like a spook in *Ghostbusters*. More than ever, I appreciated the razor-sharp snap of MacPaint on the Macintosh.

Is a light pen the best computer-graphics choice for you? Sit down and test one out. Try drawing the kinds of pictures you think you'll spend most of your hours doing. A mouse or a digitizing tablet may be most comfortable for you. But there is nothing to match the one-on-one directness of the light pen, and the low-cost ones are getting better and better. Just image what Leonardo da Vinci would have done. . . ✚

Anthony Reveaux is a San Francisco writer who is the editor of Computer Publicity News *and a contributing editor to* Artweek. *He lectures on film history at Sonoma State University and likes to take his Macintosh out for long walks.*

▸ PRODUCT INFORMATION

Gibson Light Pen System
Koala Technologies Corporation
3100 Patrick Henry Drive
Santa Clara, CA 95025-8100
(408) 986-8866
List Price: $250
Requires: Apple II, II Plus, and IIe

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For centuries, the apple has made history. Adam and Eve bit into one, and look what they learned! A certain William Tell thought apples were good for target practice. Isaac Newton had a better idea: a bonk from an apple helped him figure out gravity.

Today's most famous apples aren't round red fruits—they're blinking, humming computers. These Apples can turn out some amazing things—even help *you* make a little history.

Now, it's always tempting to tinker with your school files or start World War Three when you have a computer. But if you're the Apple Computer Clubs kind of kid, you have better dreams: the pleasure and pride of concocting clever, constructive programs with friends, family—maybe even teachers.

Hey, there's no reason a computer couldn't bake an apple pie if you programmed it to turn on the food processor and open the oven door. But we've all had more experience doing things with apples than with Apples. To really make your Apple cook, you need high-tech know-how AND direction. Having a few books handy could really help.

Fortunately, another step forward in apple history has just been made: the fact-packed activity handbooks you need are here. They're the Apple Computer Clubs Handbooks, and they let you (and adults) in on Apple computer everything! From fundamentals to innovations that whet your imagination.

There's a chunk of information about the Apple. So you can investigate its inner workings. Give it proper care and feeding. Exterminate the bugs that crash programs.

There are bushels of ideas for *you*—along with programs, projects, and tips for "Apple-cations" you may never have dreamed of. Like using the Apple to • test for ESP • review for that geography test • invent an adventure game • talk to friends across town through your keyboard • tutor a tyke • you name it. There's more about new languages, graphics, life in the computer world, contests . . . enough to feed everyone's enthusiasm, and look—no seeds!

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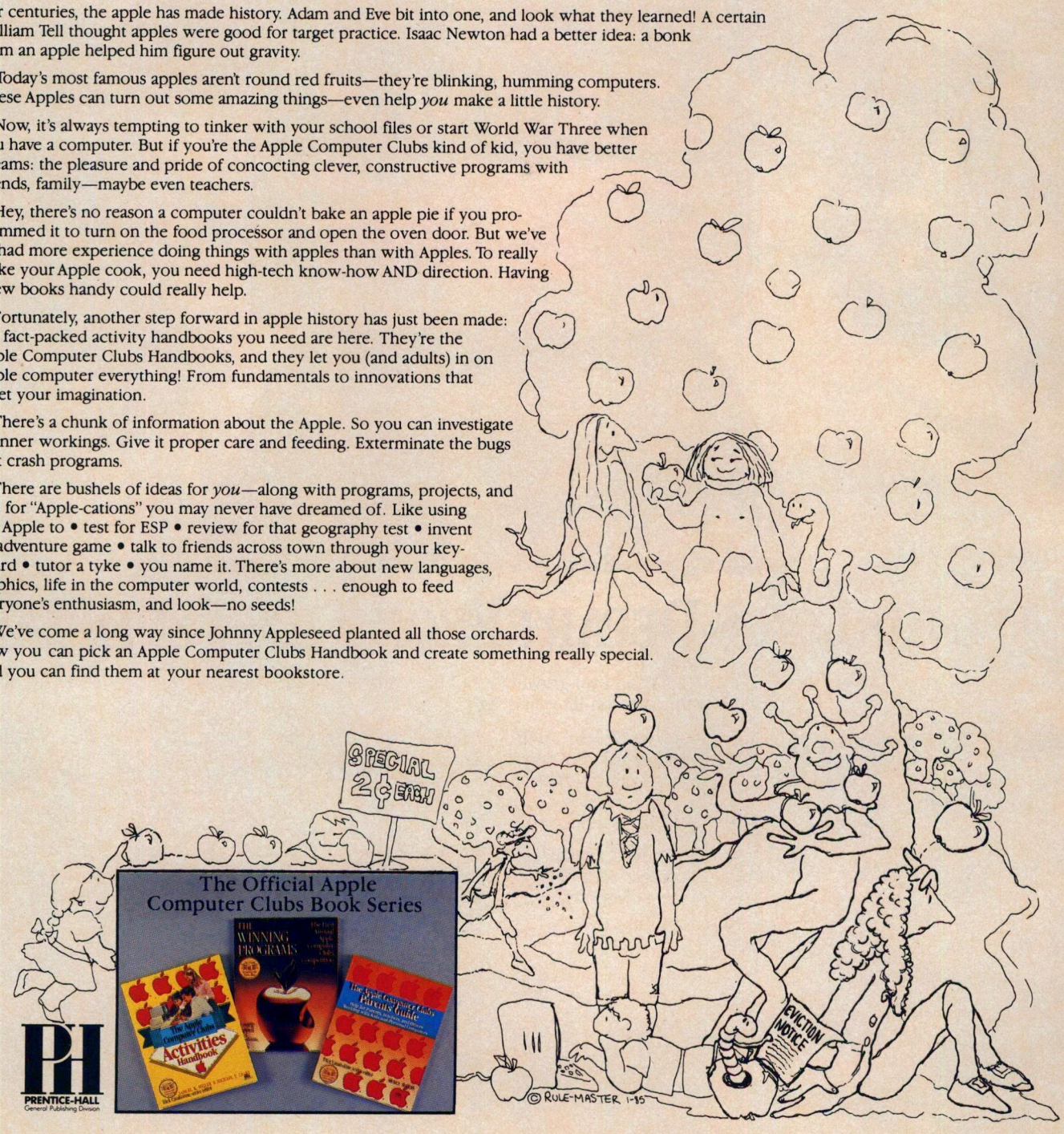

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CIRCLE 271 ON READER SERVICE CARD

TRACKING THE AFFORDABLE HOME SERVICE

A short time ago, representatives of a major modem manufacturer demonstrated the company's new 2400-bit-per-second (bps) modem, a marvel of telecommunications technology with special circuitry to keep your signal from being lost over Kansas. Well, at least strong enough so you didn't have to tap your modem three times and wish for a connect whine.

The highlight of their visit came when one of them mentioned that their company was a price leader in the industry and strove to undercut the competition. In fact, the representative remarked that a 1200-bps modem was fairly inexpensive to manufacture.

"Oh really? How inexpensive? Less than $200?"

"Certainly," an assured reply came.

"Less than $100?"

"Definitely."

"Ahem, I didn't just get off the space shuttle. Is this an April Fools' joke? No? Then, less than $50?"

Again, an affirmative answer.

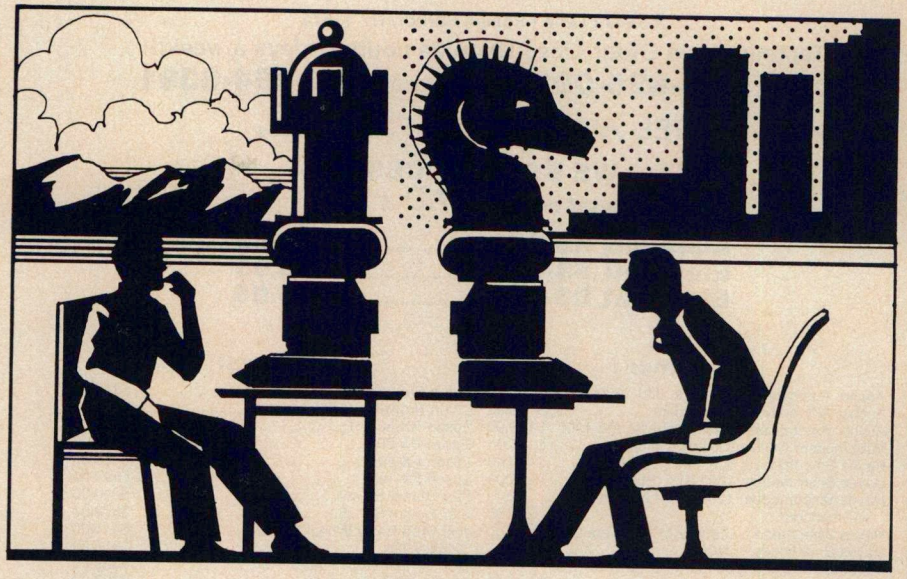
Alas, that was all they would say, and that figure probably did not include research and development, manufacturing start-up, advertising, salaries, and other necessities. Still, after I heard that figure, the retail price of a 1200-bps modem struck me as nothing less than incredible.

When I hear that a telecommunications service is going to charge $2 per hour of connect time, on the other hand, that figure also strikes me as incredible, for the opposite reason. Is that an April Fools' joke, too?

No, it is not.

PlayNet

PlayNet, the brainchild of former General Electric research scientists Howard S. Goldberg and David Panzl, is a telecommunications service for the home. It is just getting started, so its selection of services is a bit limited, but the potential is practically unlimited. At those prices, it should be able to bring in consumers previously put off by the high price of telecommunications.



Lest you think price is all that matters, look again. Instead of transmitting only alphanumeric characters, PlayNet edges closer to sending full-color graphics over the phone lines. The key is your computer. Instead of functioning as a "dumb" terminal connected to a mainframe or minicomputer, your Apple acts as it should—as a smart computer.

PlayNet edges closer to sending full-color graphics over the phone lines.

PlayNet provides you with a system disk, which functions as communications software. You boot it and dial up PlayNet. Choosing Menu Selections whisks you to the features of the system.

The most useful feature, and the most addictive, is on-line communications. Like CB on CompuServe or Chat on The Source, Talk on PlayNet allows you to carry on live typed-in "conversations" with other subscribers. As at a big party, you can talk to all the people in the room or draw someone off to the side for a private chat. You meet the most interesting people on-line.

Electronic mail is also available. Those interesting people you meet using the Talk feature may not always be on-line at the same time you are. To keep in touch, you can send messages up to 45 lines long to their electronic mailboxes. You also own a personal mailbox. If you happen to have mail waiting for you, the word *mail* appears on your screen, and it remains there un-

MICHAEL SANCHEZ

til you have read your messages.

PlayNet also hosts several bulletin boards for posting public messages. Just as with electronic mail, you create a message (80 lines maximum), but the message goes up on the bulletin board and is intended for all who care to read it, instead of being addressed and sent to a particular person. You can respond to a bulletin-board message while looking at the board.

Electronic file transfers are also available. The sender uploads a file to PlayNet, and the receiver downloads it from PlayNet. No offense meant, Federal Express, but even ZapMail is not this quick.

The other main section of PlayNet is for games. If you find an opponent via the Talk command or through electronic-mail messages, fine. Proceed to the game room. If you encounter problems finding an opponent, however, you can invoke the Locate Game Partners function. It asks you various questions about skill levels and game type and then asks other subscribers if they want to play you.

Once you've found an opponent, both of you plug a game disk into your computer. Your Apple displays full-color graphics on the screen, which is a definite improvement over alphanumeric characters. Best of all, you can send messages to the other player as you play the game. The combination of these two features makes PlayNet rather attractive.

Good graphics does not a game make, however. Quite frankly, I am a bit disappointed at the lineup of games. Don't get me wrong—I enjoy a good game of boxes or hangman, but I miss Adventure, multiplayer space-war games, and other standbys.

Let me list the games and let you decide: backgammon, Boxes (connect dots to form boxes), Capture the Flag (i.e., Stratego), checkers, chess, Chinese checkers, contract bridge (for four), Four-In-A-Row (two-dimensional Score Four), Go, Hangman, Quad 64 (three-dimensional Score Four), Reversi (i.e., Othello), and Sea Strike (i.e., Battleship).

When PlayNet introduces a magnificent new game, you can immediately download the program onto disk.

As you can see, all are good games, and certainly interactive enough, but rather bland. Fortunately, PlayNet is developing new games to satisfy other interests and picky reviewers.

Immediate Updates

Another unique feature of PlayNet is that you can receive updates from it as soon as they are available. Thus, when PlayNet introduces a magnificent new game, you can immediately download the program onto disk. It doesn't even have to be a formatted disk.

Cost

Finally, how much is it going to run you? I said $2 per hour, and that is what it costs—including telecommunications charges via Telenet. Direct dialing also costs $2 per hour, but AT&T's long-distance charges will bankrupt you. Incidentally, PlayNet bills in whole minutes and charges you for at least six minutes each time you sign on.

You must also pay a reasonable one-time membership fee of $30 and a

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monthly maintenance fee of $6. Although I personally oppose minimum fees, PlayNet almost deserves forgiveness because of its economical $2 hourly connect charge. Almost.

PlayNet is certainly a step in the right direction for telecommunications. It combines communications and entertainment at a price accessible to all home-computer users. It may even attract a few business users. For your non-Apple-using friends, the service is also available in Commodore 64 and IBM PCjr formats. PlayNet is worth a serious look.

Updates

Long-time *A+* readers know of the several telecommunications services I've reviewed in past issues. Many of the services I've covered have added new features lately.

NewsNet (see the April 1984 issue), which carries full-text versions of more than 200 business newsletters, has added several more.

New additions include Biotechnology Investment Opportunities, Mid-East Business Digest, Japan's Monthly Finance Review, Reports of Interest to Lawyers, Space Commerce Bulletin, International Videotex Teletext News, High Tech (West Germany), Tradevest Ratings (stocks, bonds, and gold), and Religious News Service Daily News Reports.

CompuServe (see November 1983) expands its brokerage service and adds a portfolio-maintenance service. The 150,000 CompuServe subscribers can access stock and option quotes, place orders, and review their portfolios with Trade*Plus, providing they are also clients of one of the brokers affiliated with Trade*Plus.

CompuServe also offers video banking through VideoFinancial Services. Subscribers can conduct transactions electronically, 24 hours a day, with any bank in the United States that is connected to VideoFinancial Service's computer-gateway facilities. VideoFinancial Services is owned by a consortium of seven major banking organizations.

The Source (see November 1983) has reduced its $100 membership fee to $49.95. It also has added Official Airline Guide, Accu-Weather, and a membership directory.

The Source is also introducing financial-investment services through Spear Securities, an independent brokerage firm specializing in electronic-security transactions. You can receive market-price changes automatically and place orders electronically. You can even create a "paper portfolio" and test investment strategies without risking a penny, except for the connect-time charges, of course.

ITT Dialcom (see June 1984) has announced XMAIL service, which links its electronic-mail system to the worldwide telex and telegram network. Notebook computers can replace dedicated telex terminals, thus allowing traveling executives to send messages from any phone. A single message can be delivered to as many as 500 addresses simultaneously.

TeleLearning Systems (see August 1984) is offering a complete telecommunications package for Apple II computers.

The package includes a 300-bps auto-dial/auto-answer modem, ASCII Pro software, and registration and access to more than 60 databases. The suggested retail price is $175.

GameMaster (see December 1983) has added Cosmic Cartels, a multiplayer space game of conquest. Up to 150 players vie for 800 planets. Turns are due daily. GameMaster estimates that each game should take two to three months to complete and awards one

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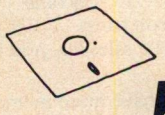

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Micro Math (Add-Sub)	20.90
Micro Math (Multi-Div)	20.90
LEARNING COMPANY	
Rocky's Boots	30.75
Number Stumper	25.90
Robot Odyssey	30.75
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Magic Spell	22.90
Juggle's Rainbow	18.90
Bumble Games	24.90
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Gertrude's Puzzles	27.90
Gertrude's Secrets	27.90
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Basic Building Blocks	49.90
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The New Step by Step	73.90
Step By Step II	73.90
Step By Step III	73.90
SCARBOROUGH SYSTEMS	
Songwriter & Picturewriter	25.00
Phi Beta Philer	24.90
Master Type	24.90
SCHOLASTIC WIZWARE	
Fact & Fiction Tool Kit IIc	24.90
Microzine (1–6)	ea. 24.90
Story Tree	24.90
Turtle Tracks	24.90
SPINNAKER SOFTWARE	
Fraction Fever	19.00
Trains	21.90
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Alphabet Zoo	19.00
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In Search of	25.00
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Kidwriter	19.00
SPRINGBOARD	
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SUNBURST	
The Factory	30.00
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Sticky Bear ABC	24.90
Sticky Bear Numbers	24.90
Sticky Bear Bop	24.90
Sticky Bear Opposites	24.90
Sticky Bear Shapes	24.90

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APPLE	
Appleworks	Call
Apple Writer IIe	124.90
ARTSCI	
Magic Office Systems	187.90
Magic Calc	94.00
Magic Window II	94.00
ASHTON-TATE DB II	285.00
BPI	
General Accounting	245.00
GL, AR, AP, PR or INV	245.00
CONTINENTAL	
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Tax Advantage	42.90
FCM/FL	61.90
G/L, A/R, A/P	144.00
DOW JONES SOFTWARE	
The Market Analyzer	215.00
Market Manager	185.00
HARPER AND ROW	
The Write Stuff	41.00
HOWARD SOFTWARE SERVICES	
Real Estate Analyzer II	145.00
KENSINGTON	
Format II Enhanced	92.00
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MEGAHAUS	
MegaFinder	104.90
MegaSpell	44.90
MegaWorks	Call
MegaWriter	66.90
MICROPRO	
Wordstar	217.00
Calcstar	110.00
Wordstar W/Z Card	255.00
MICROSOFT Multiplan	75.00
PEACHTREE Peach Calc	91.90
QUARK	
Lexicheck/Word Juggler IIe	120.00
SENSIBLE SOFTWARE	
Sensible Speller	74.00
Bookends	74.00
Report Card	37.00
SIERRA ON-LINE	
The General Manager II	133.00
Homeword	43.00
ScreenWriter IIe	78.00
SILICON VALLEY	
The Handlers Package	104.90
List Handler	46.90
The Word Handler II	46.90
SOFTWARE ARTS	
Visicalc Package	120.00
SOFTWARE PUBLISHING	
PFS: Access	Call
PFS: Write	74.00
PFS: File	74.00
PFS: Graph	74.00
PFS: Report	74.00
STONEWARE	
DB Master 4 Plus	215.00
VISICORP	
Visitrend/Visiplot	62.00

MacIntosh

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PFS: Report	74.00
PFS: File/Report	120.00
Typing Tutor III	31.00
Millionaire	36.00
Transylvania	20.00
Coveted Mirror	20.00
The Quest	20.00
Main Street Filer	118.75
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Click Art	29.00
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Microsoft Multiplan	120.00
Microsoft Basic	90.00
Microsoft Chart	75.00
Microsoft Word	120.00
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Zork I	24.00
Zork II & III	30.00
Master Type	30.00
1st Base	116.00
DB Master (Mac)	117.00
DaVinci (series)	ea. 30.00
Habadex	72.00
TK Solver	175.00

Printers

APPLE	
Imagewriter (10 & 15")	Call
BROTHER	
HR-25	655.00
HR-35	830.00
DAISY WRITER 2000	Call
DIABLO	
620 (RS-232C)	850.00
630 (PC)	1,785.00
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DYNAX DX-15	375.00
EPSON	
FX-80	376.00
FX-100	570.00
RX-80F/T	285.00
RX-100	385.00
LQ-1500	990.00
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N3530	1,255.00
P2T	665.00
JUKI 6100	410.00
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MT-180L	795.00
MT-Spirit	295.00
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Microline 82A	309.00
Microline 83A	435.00
Microline 92P	385.00
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KXP 1090	235.00
KXP 1091	295.00
KXP 1092	435.00
KXP 1093	635.00
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8510AP	325.00
1550AP	525.00
8510SP	445.00
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Daisywheel A10-20S	505.00
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EXP500P	325.00
EXP550P	425.00
EXP770P	745.00
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Gemini 10X	258.00
Gemini 15X	365.00
Radix 10 (200 CPS)	495.00
Radix 15 (200 CPS)	595.00
Delta 10	345.00
Delta 15	475.00
TOSHIBA Printers	Call
TRANSTAR	
120P	425.00
130P	550.00
315	455.00
Pics Card	95.00

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APPLE	
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Duo Disk w/acc. kit	Call
Pro File Disk Drive	Call
IIc Add-On	Call
Mac Add-On	Call
INFAX	
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102 20 Meg	3,350.00
INDUS GT Slimline	250.00
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Slimline IIe	210.00
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Dollars & Sense/Mac	87.90
Copy Master II	Call
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Beagle Basic	21.90
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Einstein Memory Trainer	55.00
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Bank Street Speller	43.00
Bank Street Filer	Call
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Flying Colors w/Printout	55.00
Time Trax	68.00
DATA TRANSFORMS Fontrix	44.90
Font Paks 1-9	ea. 14.00
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LAZERWARE Lisa V 2.6	56.00
MECA Managing Your Money	129.90
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TG Joystick	Call
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Final Words

If you are wandering around in CompuServe, try the *Creative Computing* SIG at PCS-22. It is one of the best places to find out the latest information on the computer industry and the opinions of the owners of other personal computers.

Stay tuned for more information about the rapidly evolving telecommunications field. More and more services are being offered, and, if PlayNet is any indication, lower prices will bring these services within reach of the vast home market. Now, if PlayNet could only sell a 1200-bps modem for $100 . . . +

Russ Lockwood is an assistant editor at Creative Computing *and a former staff writer for The New York Times Information Service.*

▸ FURTHER INFORMATION

PlayNet
200 Jordan Road
Troy, NY 12180
(800) PLAY-NET
CIRCLE 501 ON READER SERVICE CARD

NewsNet
945 Haverford Road
Bryn Mawr, PA 19010
(215) 527-8030
CIRCLE 502 ON READER SERVICE CARD

CompuServe
5000 Arlington Centre Blvd.
Columbus, OH 43220
(614) 457-8600
CIRCLE 503 ON READER SERVICE CARD

The Source
1616 Anderson Road
McLean, VA 22102
(703) 734-7500
(800) 336-3366
CIRCLE 504 ON READER SERVICE CARD

ITT Dialcom
1109 Spring Street
Silver Spring, MD 20910
(301) 588-1572
CIRCLE 505 ON READER SERVICE CARD

TeleLearning Systems
505 Beach Street
San Francisco, CA 94133
(415) 928-2800
CIRCLE 506 ON READER SERVICE CARD

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- Comrex Slimline Duo Drives (2 Drives)
- Apple Controller w/PRO DOS
- Printer Card & Cable
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- Zenith Grn. Phosphur Monitor
- Deluxe Steel Printer Stand
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- Grappler + Interface
- w/Cable
- Deluxe Printer Ribbon
- Case of Computer Paper
- Printer Dust Cover

IIc w/Hanzon Interface $739

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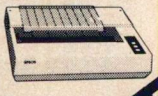
FX-80+ INCLUDES:

- FX-80 160 CPS Printer
- Buffered Grappler + (16K) Interface w/Cable
- Deluxe Printer Stand
- Extra Printer Ribbon
- Case of Computer Paper (1800 Sheets)
- Printer Dust Cover
- "Epson-Apple Connection" A detailed book on how to use the Epson w/the Apple



LIST $889 — CDA PRICE $619

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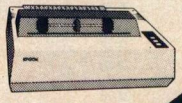
- Grappler + Interface
- Deluxe Printer Stand
- Extra Printer Ribbon
- Case of Computer Paper (1800 Sheets)
- "Epson-Apple Connection" A detailed book on how to use the Epson w/the Apple



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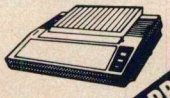

LIST $579 — CDA PRICE $379

APPLE ACCESSORIES SOFTWARE -- Including MacIntosh

APPLE ACCESSORIES		
ALS Smartterm II	$179	99
ALS Z-Engine	199	149
Apple IIc Mouse	99	83
Apple IIe Mouse	149	132
Apple Joystick	59	49
Hayes Mach III Joystick	54	37
Kensington Systm Svr.	89	64
Koala Touch Tablet	125	79
Kraft Joystick	49	33
Micro Sci Ext 80 Column Card 64K	199	99
Microsoft Softcard II	395	289
Orange Buff.Grplr. 16K	199	144
Orange Buff.Grplr. 64K	319	198
Pace Fan w/Surge	99	49
Videx Videoterm w/SS	309	219
APPLE DRIVES		
Apple IIc Add-On	$329	279
Apple Disk II	329	279
Mitak Mate-1	199	149
Micro Sci A2 Drive	299	199
Micro Sci 1/2 Hght. IIc	299	209
Rana Elite 1½ Hght.	329	209
Rana Elite 1½ Hght.IIc	339	219
MODEMS		
Hayes Micromodem IIe	$339	229
Hayes Micromodem IIc	339	249
Novation Apple Cat II	319	219
Novation Apple Cat 212	595	429

DISKETTES (per box of 10)		
SKC 5 ¼" SS DD	$ 27	14
SKC 5 ¼" SS DD	29	16
SKC 5 ¼" DS DD	34	19
PRINTER BUFFERS		
Practical 64K Parr.	$349	249
Quadram Microfazor 16K	199	149
Quadram Microfazor 64K	299	239
PRINTERS		
Apple Imagewriter	$595	495
Brother HR-15	499	389
Brother HR-35	1245	829
Epson (All Models)	Call	Call
Juki 6100	599	439
Okidata (All Models)	Call	Call
Panasonic KXP 1091	469	309
MONITORS		
Amdek Color 300	$339	259
Amdek Color 600	599	399
Apple Color 100	699	499
Princeton HX-12	599	489
Slot 7 RGB Interface	199	139
Zenith Green Phosphur	149	94
Zenith Amber Phosphur	159	99
SURGE PROTECTORS		
EPD Lemon	45	35
EPD Lime	70	49
EPD Peach	60	47
EPD Orange	100	74

APPLE SOFTWARE		
ALS/Silicon Valley		
Word Handler	$ 80	39
Handler Pack	130	85
Ashton-Tate d Base II	495	299
BPI Accts. Payable	395	269
Accts. Receivable	395	269
Gen'l. Acctng.	395	269
Payroll	395	269
Barrons		
Study Prgm. SAT	90	60
Broderbund Print Shop	50	34
Bank St. Writer	70	45
Bank St. Speller	70	45
Wrtr./Speller Combo	140	85
Continental Home Acct	75	49
Compuserve Starter Kit	39	29
Dow Jones Mrkt. Analyzr	350	219
Mrkt. Manager	300	189
Mrkt. Microscope	349	219
Microsoft Multiplan	179	129
Micropro (requires Z-80 CPM)		
Wordstar	350	189
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- Absolutely, positively, totally PRO-DOS and DOS 3.3 compatible.
- Time in hours, minutes, seconds and milliseconds (the ONLY PRO-DOS compatible card with millisecond compatibility).
- 24 hour military format or 12 hour with AM/PM format.
- Date with year, month, day of week and leap year.
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- The only card recognized by both the DOS 3.3 and PRO-DOS versions of Apple Writer IIe.
- Appleworks will now time and date stamp all your data automatically.
- Compatible with ALL of Apple's languages. Many sample programs for machine code, Applesoft, CP/M and Pascal on 2 disks.
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- Rechargeable nickle-cadmium battery will last over 20 years.
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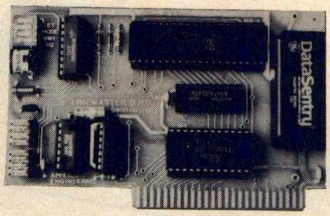

	PRO-DOS COMPATIBLE	INCLUDES DOS DATER	MILLISECOND TIME	YEAR DATA	LARGEST SAMPLE SOFTWARE	REMOTE SET PORT	BSR PORT	EMULATES ALL OTHER CLOCKS
H.O	YES	YES	YES	YES	YES	YES	YES	YES
BRAND A	NO	NO	YES	NO	NO	NO	NO	NO
BRAND C	NO	NO	NO	NO	NO	NO	NO	NO
BRAND M	NO	NO	NO	NO	NO	NO	NO	NO
BRAND P	YES	YES	NO	YES	NO	NO	NO	NO
BRAND S	NO	NO	NO	YES	NO	NO	NO	NO
BRAND T	YES	NO	NO	NO	NO	NO	YES	NO

Full emulation of all other clocks. Yes, we emulate Brand A, Brand T, Brand P, Brand C, Brand S and Brand M too. It's easy for the H.O. to emulate other clocks, we just drop off features. That's why the H.O. can emulate others, but none of the others emulate us. The Timemaster II H.O. will automatically emulate the correct clock card for the software you're using. You can also give the H.O. a simple command to tell it which clock to emulate. This is great for writing programs for those poor unfortunates who bought some other clock card.

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Our BSR X-10 interface option for the H.O. allows you to remotely control up to 16 lights and electrical appliances through your BSR X-10 home control system in your home or office. You're already wired because a BSR system sends its signals over regular 120 volt wiring. That means you can control any electrical device in your home or office without additional wiring.

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- 80 characters by 24 lines, with a sharp 7x9 dot matrix.
- On-board 40/80 soft video switch with manual 40 column override.
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SUPRTERM	MORE	NO	YES	NO	NO	NO	NO	YES	YES
WIZARD 80	MORE	NO	NO	NO	NO	YES	NO	YES	YES
VISION 80	MORE	YES	YES	NO	NO	YES	NO	NO	NO
OMNIVISION	MORE	NO	YES	NO	NO	NO	NO	YES	YES
VIEWMAX 80	MORE	YES	YES	NO	NO	YES	NO	NO	NO
SMARTERM	MORE	YES	YES	NO	NO	NO	YES	YES	NO
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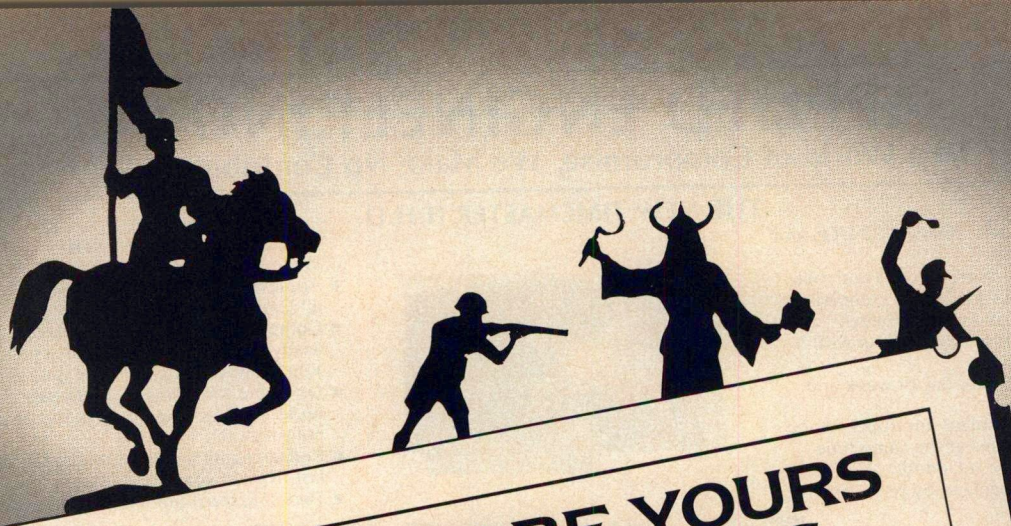

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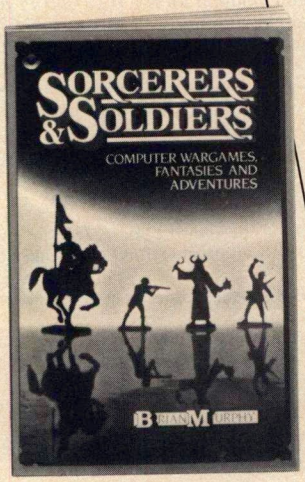

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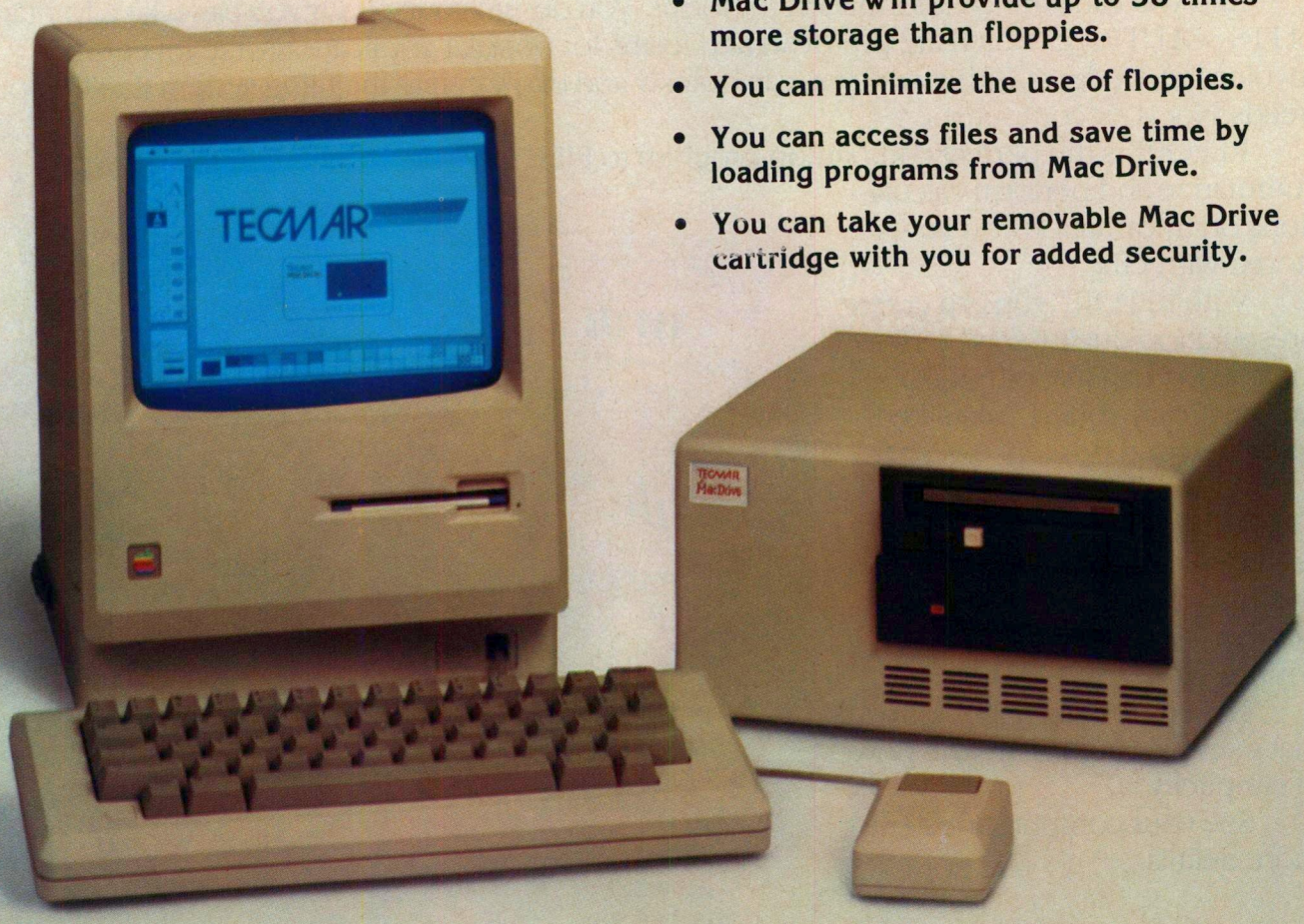

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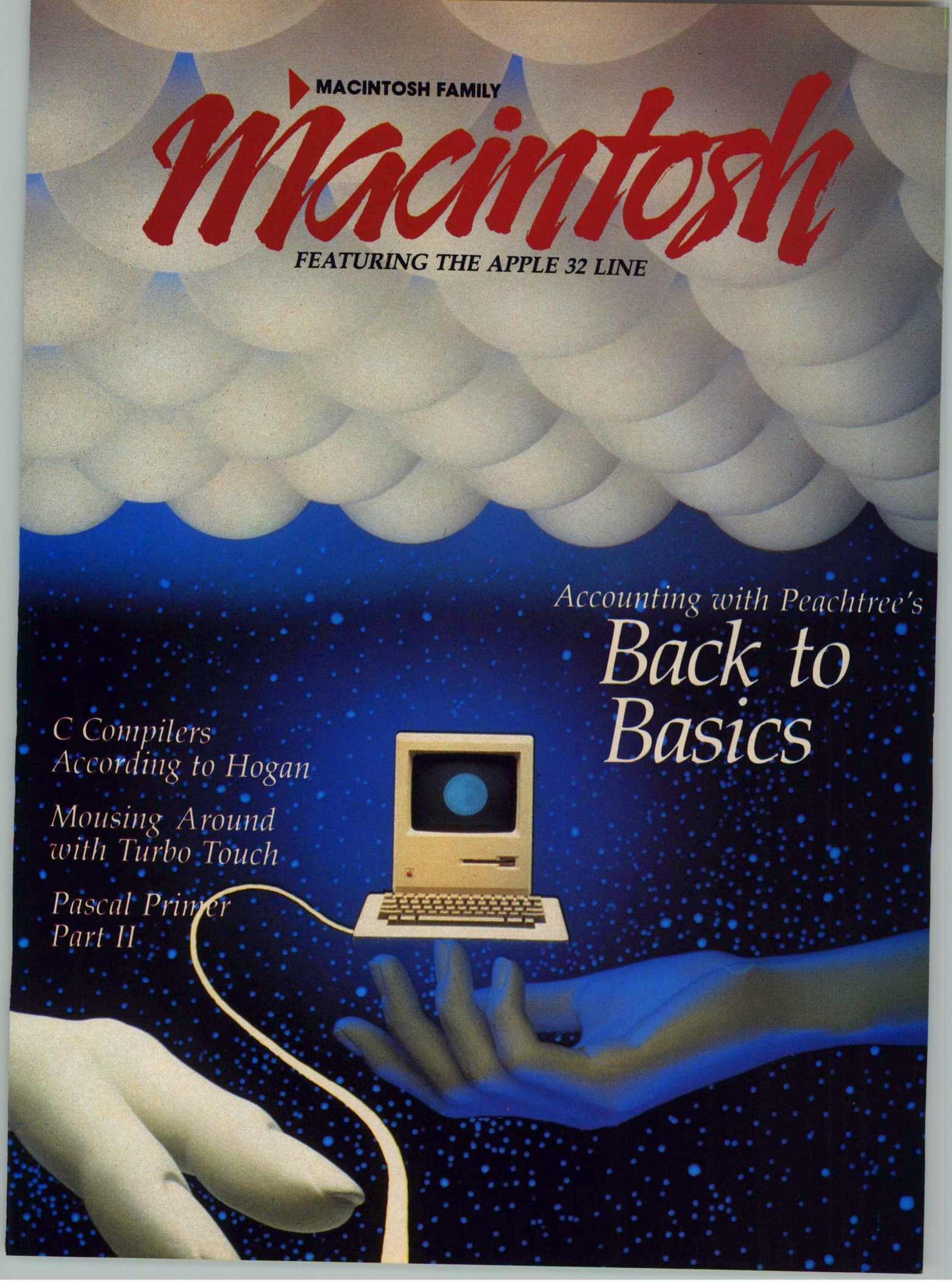


32

Peachtree gets a jump on the Macintosh-accounting market

Accounting with Back to Basics

The most important factor determining the success of Peachtree's Back to Basics Accounting System may have little to do with the product itself.

It's the first—and, so far, the only—complete accounting package available for the Macintosh, with General Ledger, Accounts Receivable, and Accounts Payable modules.

Getting to market first in the personal-computer industry means a lot. It means, among other things, that most dealers will carry your product, virtually sight unseen.

There's a simple and fairly obvious reason. When a business customer walks in the door and asks, "Is there an accounting program for the Macintosh?" the dealer wants to be able to reach up on the shelf and sell a solution right away.

In addition to being first, Peachtree is also offering its accounting modules at a highly competitive price—suggested retail of $95 each—compared with typical prices of $400–600 per module for accounting packages on other computers. Thus, you can purchase a Macintosh *plus* an accounting system for less money than you'll spend if you buy an IBM computer alone. (Back to Basics works with either a 512K Macintosh or a 128K system equipped with a second disk drive.)

Clearly, Peachtree has taken an aggressive marketing tack for Back to Basics, but even well-marketed software can survive only if the product itself works well. Here, Peachtree has done its homework, too.

Back to Basics is *not* the be-all and end-all of accounting programs, but it is an easy-to-learn, easy-to-use package that's well suited to small businesses. We like this product. In fact, we're already running our own books on it.

The program does, however, occasionally bend standard accounting conventions just a bit—not so far that an IRS auditor will pitch a fit, but enough that a practiced accountant may find it less than ideal.

It really isn't made for accountants, though. The General Ledger manual opens with a 56-page discussion of accounting principles. It's a good, short introduction to accounting for the neophyte, but it glosses over some of the fundamental issues that an account keeper might have to face head-on, such as determining what to treat as an expense and what to treat as a capital asset.

Once you finish that intro, you're ready to plow into the actual program—or, rather, just about ready. Although the manual is meant to stand on its own—independent of Apple's own manuals—it's easier to understand how to use the program on your Macintosh if you go through Apple's documentation first.

Back to Basics does use standard Macintosh point, click, cut, and paste procedures. You can't cut and paste from one of its reports into MacWrite, though.

The General Ledger program (which we'll focus on for the rest of the review) is designed well enough that it can also handle accounts receivable and accounts payable for a

KEVIN O'SHEA

very small business, at least until that business gets large enough to need the extra tracking information it can obtain with the additional modules.

When you start with the General Ledger, the program asks you to supply some fundamental information about your current accounting status.

At this stage, it gives you the option of protecting your data files with a password. Once you enter a password, you can't change it, which could be a problem if an unauthorized person got access to your password or if you forgot it. Therefore, you're probably better off just locking up your data disks, the same way you'd lock up paper files in a file drawer.

The program also asks you to enter a six-character identification code for your business. Count 'em—six. It won't take five (so *Apple* won't work), and it won't accept trailing spaces as characters. (The manual, incidentally, conveniently uses the six-character example of *Scotts*, but not all of us can be so lucky.)

An Open and Shut Case

Moving around within the program is as simple as opening and closing file drawers. On the left side of the screen, a display (see figure 1) gives you the basic options. To select one, just click on the drawer you want, and it will open to that part of the program.

Now you're ready to define your accounts and to transfer current information into them. Back to Basics starts you off with 75 standard accounts that you can add to (up to 254 in all), modify, or replace. Realistically, you'll probably need to change at least a few of these accounts to meet your specific needs, especially if you do any kind of manufacturing. (The list omits manufacturing-specific categories such as Raw Materials and Finished Goods.)

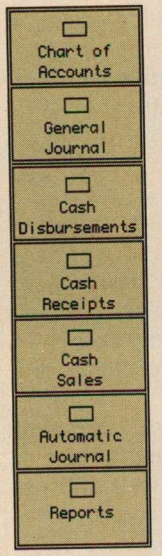


Figure 1: File drawers offer an easy way to get around in Back to Basics. Just select the one you want by pointing at it, click, and the file drawer will open.

You enter information into these accounts through the General Journal. Back to Basics requires you always to balance entries before recording them—reminiscent of the accounting professor who said, "Why do the books balance? Because we make them balance."

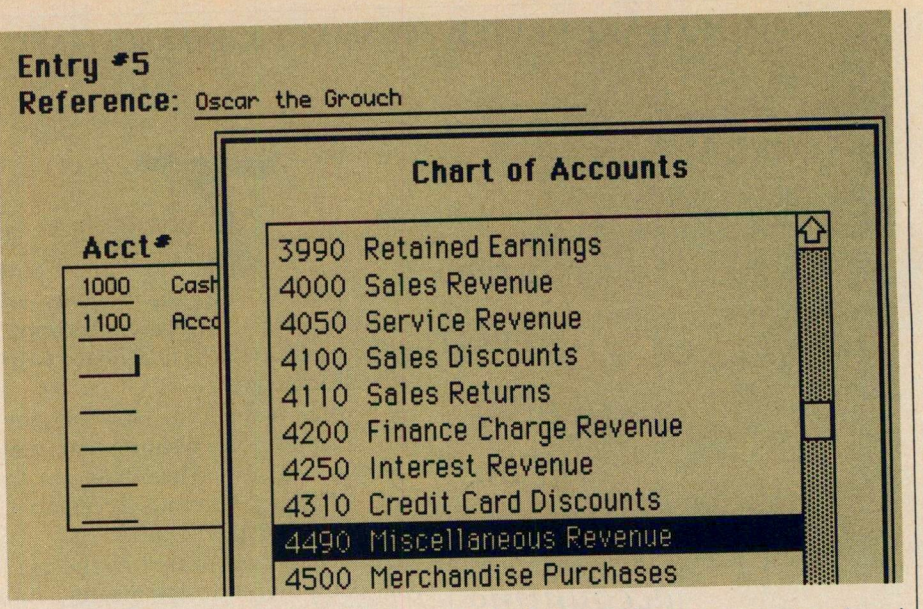


Figure 2: A window of accounts pops up on the screen to help you remember the names and numbers of accounts. (You can also print accounts on paper, if you prefer.) Back to Basics gives you 75 accounts to begin with; you can add more as you want.

This methodical entry-by-entry approach helps prevent mistakes, but here's one place where the program wavers from standard conventions: You enter all that information into a single column, rather than into separate "debit" and "credit" columns.

If you forget the number of an account, you can call it up through the Reference option on the main menu bar, which brings up a window of accounts like the one shown in figure 2.

Peachtree claims that you can make up to 4500 entries a month, but if you push it that far, the program will suffer from the one and only problem that most people encounter with the Macintosh: relatively slow disk access. Half that number of entries (or fewer) is probably a more realistic expectation, unless you have a hard disk.

Cash-based businesses such as retail operations can best utilize the next three file-drawer options: cash disbursements, cash receipts, and cash sales. Through these, you can use your Macintosh to print and track checks, as well as to track deposits and cash-register sales.

The cash-sales journal, for instance, allows you to track revenue for each of your product lines and (if you've set up the Cost of Goods account correctly) keep records on inventory for each type of product.

Whenever you make an error in this or any other part of the program, you can void the transaction by using the pull-down edit menu. Voiding involves reversing the entry—a good feature, since it allows you to maintain a trail for an audit later.

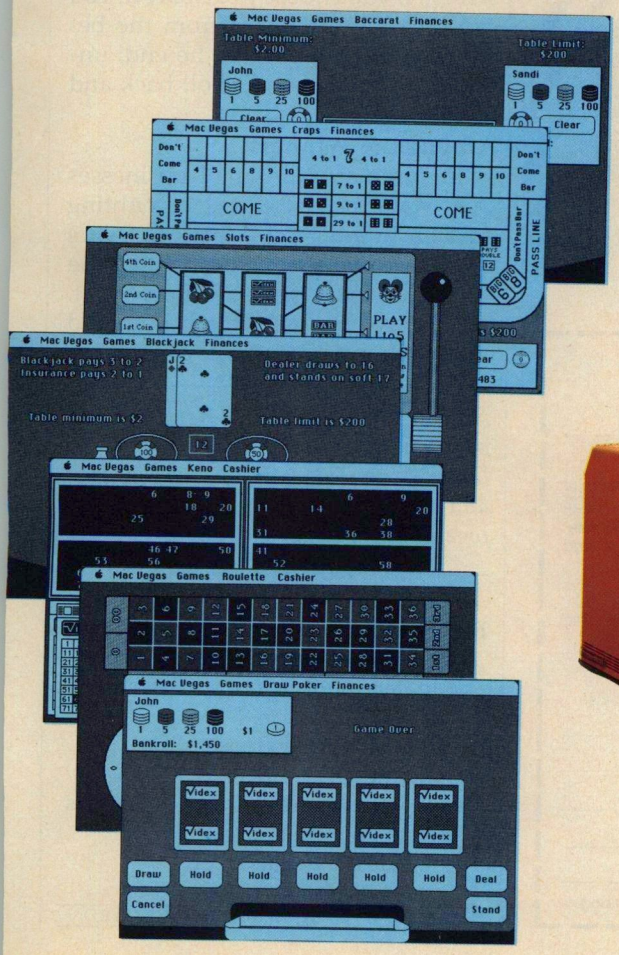
In addition to making day-by-day entries, you can also instruct Back to Basics to make automatic adjusting entries every month for prepaid expenses such as rent, insurance, interest, and depreciation.

If you're currently maintaining records by hand, you probably realize that this kind of entry can often be a source of mistakes, simply because it's tedious to enter month after month. With Back to Basics, you need only enter the repetitive information once and let your Macintosh automatically add it each month to the ledger.

Even though it's an excellent feature, don't be overzealous in its use. You should still maintain manual depreciation schedules. Also, when you fully expense or depreciate any asset, you must remove it manually from the automatic journal. If not, the journal will continue to take out depreciation dollars on it, even though—on paper—it's worth nothing.

Closing the Books

At the end of each month, you can close the books and post your results. Once you've posted them, you can



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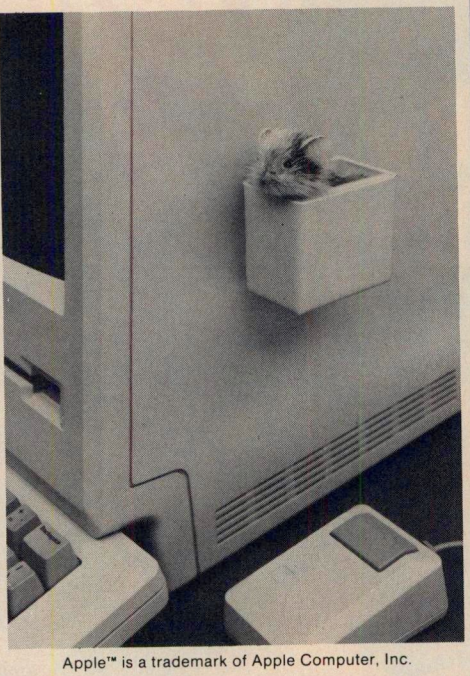

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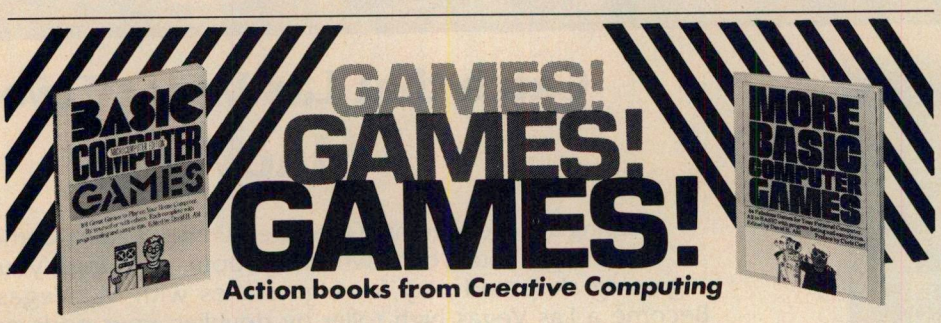

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You can create any of eight reports to review the month's transactions.

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- Cash Disbursements Journal
- Cash Receipts Journal
- Cash Sales Journal
- Detailed General Ledger
- Departmental Income Statement
- Consolidated Income Statement
- Balance Sheet

Because these records are maintained throughout the month, you can check them any time you want to review your current status—if you need information to ask for a loan, for instance.

You'll notice one small problem with the way the reports are set up, however. You can choose either to print a report or to display it on the screen. If you choose to display it, you can only view forward from the beginning of the report to the end; unfortunately, you can't scroll back and forth through it.

Among the Winners

In summary, for small businesses that want an excellent accounting package at a fair price, Back to Basics is going to be tough to beat. It's the first, and there will be more—but, when the dust has settled, it should certainly rank among the winners. ✚

Nancy K. Dirksen is a free-lance accountant and J. Anthony Dirksen a free-lance writer. They, their two children, and miscellaneous computers all live together in Silicon Valley.

PRODUCT INFORMATION

Back to Basics Accounting System
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Management Science America, Inc.
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List Price: General Ledger, Accounts Receivable, Accounts Payable modules, $95 each; copy-protected, backup disk, $9.50

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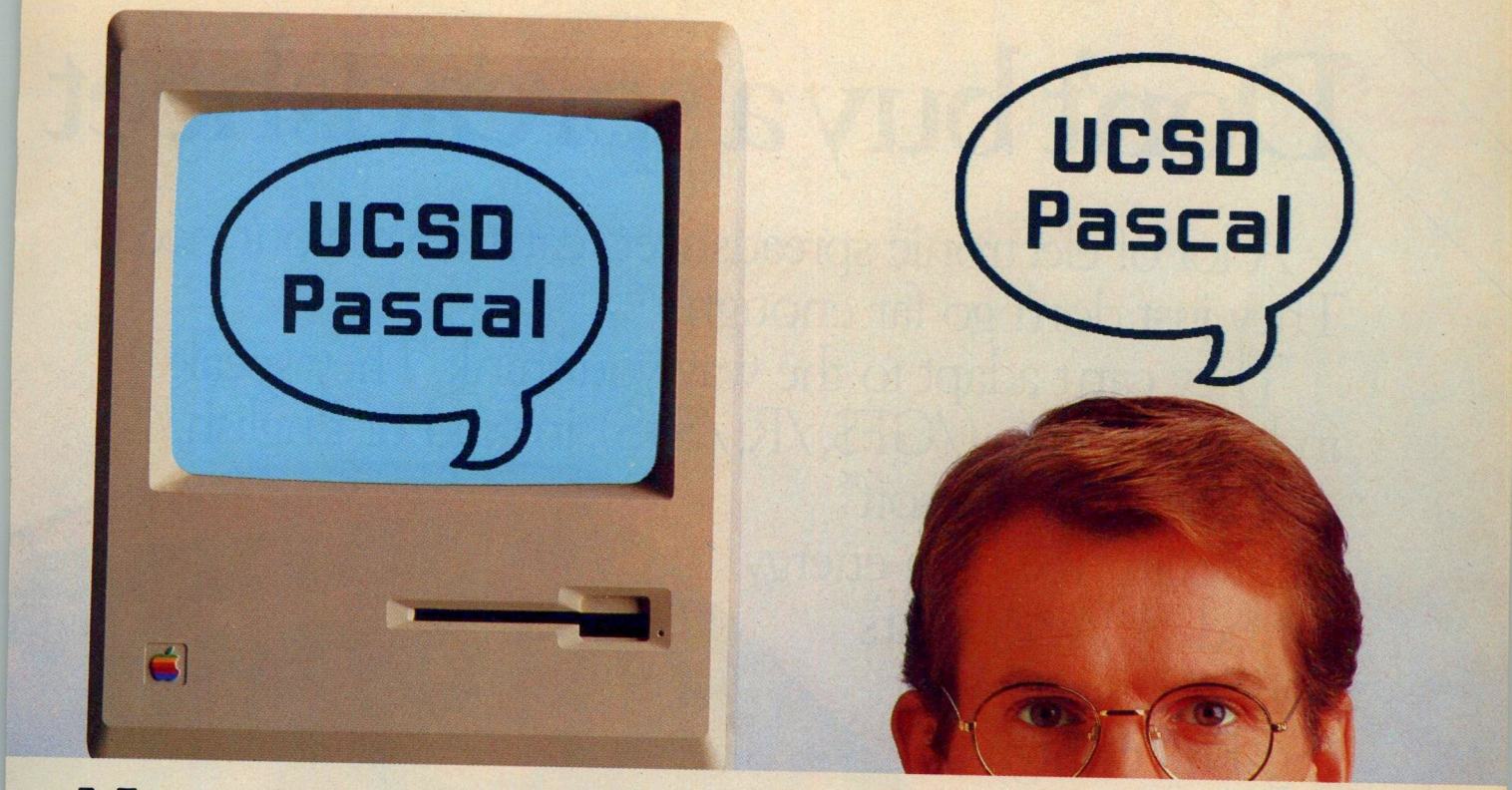

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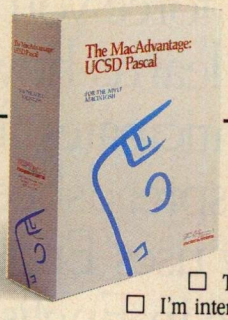

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A faster way to mouse around:

Turbo Touch

from Assimilation Process

The new Mac Turbo Touch from Assimilation Process is a high-speed direct-input device that replaces a Macintosh's mouse. Measuring about 4 × 6 inches, the Turbo Touch has a smooth round ball that sits in a housing that also contains a "mouse" button to the left and right of the ball. You use it to position the pointer on your screen by spinning the ball, much as you would with a trackball on an arcade video game.

The two buttons each perform the same function as that of the regular mouse button. Because you don't have to move a mouse around on your desk, you'll save desk space and wrist and arm energy when you use the Turbo Touch, and, because of its state-of-the-art design, you'll save time when you do work that involves lots of mousing around.

The Mac Turbo Touch comes with an installation guide and two self-adhesive velcro attachment strips that you can use to secure the Turbo Touch to your Macintosh. The designers of the Turbo Touch kept left-handers in mind; you can attach it to either side of your keyboard, and the two buttons are functionally equivalent. Personally, I'd prefer not to attach it, because I sometimes like to use my Mac keyboard in my lap (while sitting in an armchair).

If you've ever tried running a Macintosh mouse around on the arm of an overstuffed chair, you'll be grateful that the Turbo Touch doesn't move; only the ball does.

Installing the Turbo Touch involves unplugging your Macintosh mouse and plugging the Turbo Touch into the mouse port. If you want to keep your mouse available for use, you can plug it into a port on the back of the Turbo Touch.

The Turbo Touch takes a bit of getting used to. Think back to the first time you used a mouse. You probably found it awkward, but using the mouse quickly became second nature, and if you returned to using a non-mouse program, you found yourself automatically reaching for the mouse without even thinking about it.

The time you'll need to adapt to a Turbo Touch depends on your previous mouse experience. With a regular mouse, you click with your fingers and move your wrist or arm to manipulate the pointer. With the Turbo Touch, you control the ball with your fingers rather than by moving your wrist. Previous mousing involved clicking with those fingers, so you have to unlearn that motion.

I don't mean to belabor the point, however. Adapting to a Turbo Touch is easier than learning to use chopsticks, and in about two hours I'd gotten over any awkwardness. I suspect that if you've never used a regular mouse, adapting to the Turbo Touch will be even faster.

I tried out the Turbo Touch for about three weeks with a variety of Macintosh applications. Once I'd gotten used to it, I didn't want to give it up. Personally, I liked using my thumb to do the clicking, especially when dragging through menus—it's a breeze to hold down the button and flip the ball to the item of your choice.

Although you still have to move your hand away from the keyboard to point and click, I particularly noticed the Turbo Touch's advantages when I was almost exclusively mousing: when I had written a draft of an article and was mostly editing or when I was working with graphics. The Turbo Touch literature says that you can reduce editing time considerably, and it does seem to be perceptibly faster.

If you've played with trackballs in

MARK DE ROBERTS/VISIONEERING PHOTOGRAPHY

video games, you may be wondering about the precision of pointer movement. Does the pointer go flying across the screen and land beyond where you wanted it? I didn't have any such problems. Pointer positioning is equally effective if you want to move all the way across the screen or just a hair.

Using the Turbo Touch with Fatbits, for example, was great. Generally you want precision here, rather than a wide range of motion, and it's more efficient to move a finger than an arm. I also liked using it for entering numbers into Multiplan. I am an inveterate keyboarder, but with the Turbo Touch I found myself using it instead of some of the optional keyboard commands I've grown so attached to.

The one thing I didn't like about the Turbo Touch was the "feel" of the buttons. I had to push them harder than I did on a regular Mac, and they didn't click to tell me when I'd pushed hard enough. Assimilation Process has informed me that it is already dealing with that problem. Future production runs of the Turbo Touch will include contoured buttons, as well as a click (so the turbo will be identical in audio feedback to the Macintosh mouse).

Inside the Turbo Touch

So what does it take to build a better cursor controller? A brand-new PIC 1652 chip developed by General Instruments; a smooth, seamless, heavy ball (made in Belgium) with a glossy surface; and eight optical sensors, among other things. I was curious to see how the motion of a hand was translated to pointer motion, so I took the bottom off my Turbo Touch to see what it looked like inside. The ball is heavier than you'd think (I'm told it would hold up for years on a pool table) and "floats" on three freewheeling gears. Two plastic "encoder" wheels are positioned at right angles to turn as the ball turns. If you move the ball left or right, one wheel moves; if you move it up and down, the other one moves; and if you move diagonally, both move.

Each encoder wheel has holes in its rim, and its four optical sensors keep track of how many times light flashes through the holes as the wheel turns. Thus, the displacement your hand causes by moving the ball is transferred into a measurement of light that controls the cursor. The combination of the chip and the optical sensors makes the Turbo Touch function faster and more efficiently than other mice.

Assimilation Process is currently working on versions of the Turbo Touch for the Apple IIe and IIc, and company personnel use the current Turbo Touch with their own Macintoshes. Whether the world beats a path to their doorstep remains to be seen, but I think they have managed to improve on the mouse. ✚

Sue Crissman is a San Francisco Bay Area writer, consultant, and contributing editor to A+. Her clients include Apple and other computer companies for which she designs and writes training, sales, and promotional materials.

PRODUCT INFORMATION

Mac Turbo Touch
Assimilation Process
20833 Stevens Creek Blvd.
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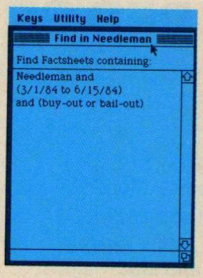

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Making It All Add Up

Peat, Marwick, and Mitchell's auditors meet the Mac

Accounting firms won't take a shaky bet. That's why it meant so much when the international accounting firm of Peat, Marwick, Mitchell & Co. took a chance on an unknown computer such as the Macintosh, a computer that wasn't completed, wasn't even officially announced to the public. The Macintosh actually won out over industry giants such as IBM and Hewlett-Packard.

Now, a little more than a year after Peat Marwick threw its support behind the Macintosh, the computer has become an integral part of all of Peat Marwick's auditing operations. The company plans eventually to use the Macintosh in each of the 18,000 audits it performs each year. The bottom line: The Macintosh has given the auditors speedier number-crunching and clearer data analysis than their previous equipment did. The Mac has also given them the freedom to think about important points, rather than laboriously check addition—and although it doesn't show up on the bottom line, the easy-to-use Macintosh has made Peat Marwick auditors computer-eager.

SeaCas

The Macintosh entered Peat Marwick under the auspices of the company's program called Systems Evaluation Approach—Computerized Audit Support, or SeaCas, instituted in late 1982. Two years earlier, Peat Marwick's board of directors had urged all the firm's groups, which include management-consulting and tax-advisory services along with the audit and accounting group, to figure out how to computerize their work efficiently. The firm's decision makers didn't leap into computerization without first looking at the matter with extreme care. First, says Richard D. Webb, partner in charge of SeaCas, they divided up their auditing method into 40-odd steps, examining all the tasks an auditor had to do and deciding whether and how well the tasks could be automated. "In some cases it might have been as simple as writing a memo; in other cases it might have been some statistical analysis. We categorized them into areas for which we thought we could develop a computer program or buy a program," says Webb.

The requirements of these tasks in priority order formed the foundation for a hardware search. Peat Marwick already used IBM mainframes and Datapoint terminals, and the Consulting Group decided the IBM PC would be its primary microcomputer. The Audit Group, empowered to make an independent selection, narrowed its choice down first to Apple, Hewlett-Packard, Xerox, IBM, and Direct—and then to only Apple and Hewlett-Packard.

John D. Collins, a partner in charge of auditing, long-range planning, and research, says the Audit Group decided to go with Apple after visiting the Macintosh "in utero" in the spring of 1982. Collins told *Management Technology* magazine that Apple "plopped a styrofoam box down on the table and announced, 'This is a Mac.'" A slightly unprepossessing beginning, perhaps, but after learning about the Macintosh's capabilities, user interface, and technological advances, Peat Marwick signed up with Apple in May 1982. SeaCas, too, wouldn't be announced for several more months. Peat Marwick secretly took the delivery of several Macintoshes to prepare in-house software and training materials.

In November 1982, the firm introduced the SeaCas program, not with the Macintosh, but with the Apple III. Peat Marwick purchased about 400 Apple IIIs as a kind of opening wedge into the microcomputer world. Every office received at least one III, one-third of the IIIs going to offices outside the United States.

With the IIIs, the auditors stuck their toes into the water. Webb explains that the firm encouraged people to use the III and supported it with in-house software and commercial packages such as Word Juggler and Quick File III. Each office was reminded, however, that the III would have to justify its cost within 12 to 18 months, "because there would be something else coming down the road—we couldn't tell them what, but there would be something."

Deciding how many Macintoshes to order once the machine hit the market took some figuring. Peat Marwick knew it wanted every senior, or in-charge, accountant to have a Macintosh—naturally, the audits were their first priority, and the in-charge accountants accompanied every audit.

MISTER PIXELMIX

Then, says Webb, "we also said that if these machines were in the field all the time, there ought to be some machines in the office for management. The estimate we ended up with was one machine for every in-charge accountant and one for every audit partner. That worked up to 2400 machines."

The Macintosh Arrives

Peat Marwick made the announcement on January 24, 1983, that henceforth it planned to use a portable microcomputer—the Macintosh—on every client audit.

By the time the company submitted its actual Macintosh order in March 1984, the number requested had leapt up to 3456.

"That told us that there was a high level of enthusiasm," Webb remembers. The number of orders has continued to increase. "I keep signing orders for more machines, and that's how it's been for weeks!" exclaims Webb. At this writing, the ratio of Macintoshes to Audit Group employees is about 4000 machines for more than 7000 employees.

Some offices went hog-wild over the Macintosh; others merely appreciate its presence.

Where the Macintosh Fits In

Peat Marwick has 97 offices in the United States alone. Each office runs its own show as far as the Macintosh goes. Some went hog-wild over the machine; others merely appreciate its presence.

The company assigned one partner in each office to be the local SeaCas coordinator, the general factotum in charge of training staff and answering questions. Larger offices in such cities as Los Angeles or New York may have several coordinators, to accommodate more personnel.

SeaCas serves as an umbrella for several types of computer support. First, it includes proprietary software, such as System 2190 and its Financial Statement Subsystem, with Basic Financial Statement and Consolidated Financial Statement (BFS and CFS)—the audit-retrieval package the group chiefly uses on IBM and Burroughs mainframes. Second, the Audit Group supports six commercial personal-computer packages: Microsoft's Multiplan, Chart, and File; and MacWrite, MacPaint, and MacTerminal.

Finally, the Audit Group uses various template programs that mix and match with the other two types of software. For example, a template might allow an auditor to take a client's financial statement, transfer it out of BFS into Multiplan, calculate some ratios there, cut and paste those ratios with Microsoft Chart, cut and paste the charts into MacWrite, and then prepare a report. Templates in use include packages for community banks, statistical analyses, deferred taxes, and "standard letters" for standard documents prepared during an audit.

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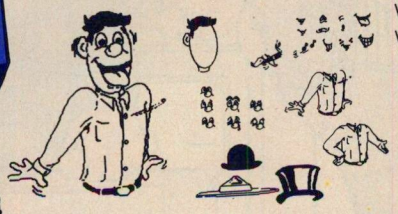

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The Macintosh is used in all three sections of SeaCas. At the mainframe level, the Macintosh works with System 2190. The auditor loads the 2190 software onto the client's mainframe and writes a short program to carry out necessary calculations, after which the machine produces a report.

Before the Macintosh arrived, this process had to wait until long after working hours, to prevent the audit from interrupting the normal stream of data processing. Now the Macintosh can take care of these calculations whenever the computer is free, however, and auditors can find the information waiting for them in the morning, stored in the Mac's disks.

Martha Marcon, audit partner in charge of SeaCas at the firm's Los Angeles office, notes that "the Macintosh works really well with the Financial Statement Subsystem." The auditors don't always use it that way, she adds, because some clients give them the information from FSS themselves. Peat Marwick trains many large or frequent clients to use FSS and then audits the information received.

In general, the auditors use the Macintosh in every phase and facet of a field audit. It can prepare a budget, post and list the time spent on the several phases of an audit, and transmit data over phone lines.

A Day in the Field

Webb unreels a long list of functions the Macintosh might perform in a day's work:

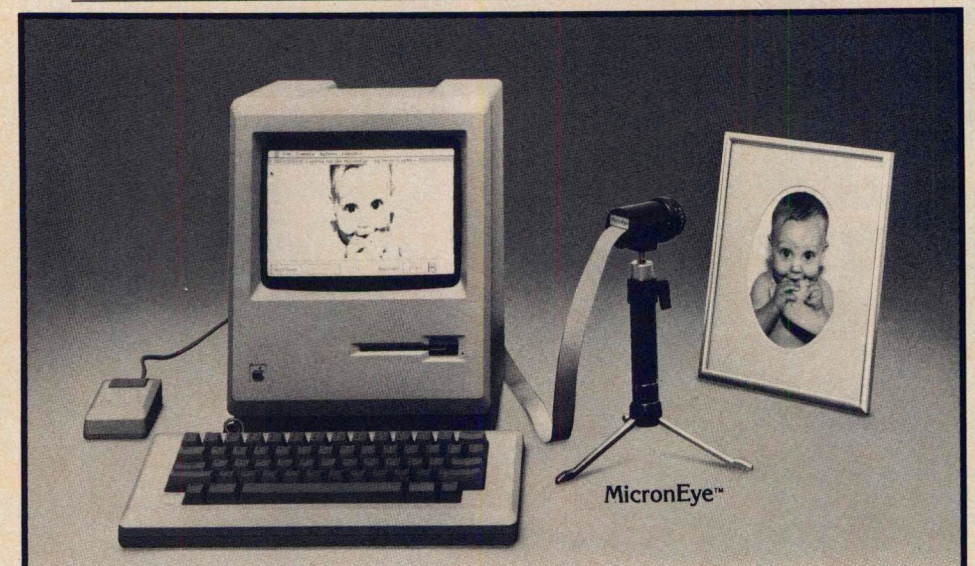
"The Mac goes out, along with its printer, in its custom-made bag to the engagement site. We hook the modem up. You can check the electronic-mail system for messages. You can check what's happening with a job in Frankfurt because it's related to what you're doing in Chicago. You can work with MacWrite to give instructions to other auditors on the engagement.

"You can prepare a long memo for someone's electronic mailbox or use Multiplan spreadsheets for various kinds of analyses for which you might have used pencil and paper before. Or you might use the proprietary software to get data ready to prepare financial statements or to consolidate company subsidiaries into the consolidated financial statement. If you're doing a referral engagement, for example, for a parent company in Frankfurt, you can prepare data to send by electronic mail so they can download it into their financial statements there. Or you can put together a graphics presentation for the board of directors, using MacPaint. You can even teach the client how to use the machine or software so they can prepare some of the schedules for you."

The Macintosh communicates between offices via the ITT Dialcom electronic-mail system. Anywhere in the United States or Canada is no problem, says Webb. In countries to which ITT's wires haven't reached, auditors can sometimes use the local telephone system or at least send telexes.

How the Mac Changes an Audit

Jody Lindell, partner in charge of SeaCas in Peat Marwick's San Francisco office, says, "I was skeptical at first, but the Mac really changed the way we do things. It's one of the most



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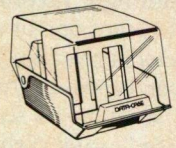

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powerful tools we've been given in a long time—it could easily have been abused.

"Maybe 10% of our audit engagements were touched by an Apple III," she adds, "but now 50 to 70% of our engagements in this initial year are in some way using the Macintosh."

Lindell worried at first that people would begin to computerize things that didn't need to be computerized, wasting time and using the machine as a toy. But, she says, "they're really using the computers in a positive way."

Marcon says that the Macintoshes help a great deal in data analysis—auditors can do more as-if analyses, modifying and changing numbers in a budgeting or forecasting approach, rather than spending most of their time mechanically checking columns of figures.

"We see a marked improvement in people's ability to interpret, analyze, and understand what we're doing, rather than spending so much of their time preparing the data," she says.

Most Peat Marwick offices use the Macintosh to prepare the multitudes of reports, letters, and memos necessary to complete an audit properly. The graphics capabilities of the Mac haven't come into play much yet, probably because of the timing of the release of Microsoft Chart, says Marcon. It arrived right at the start of the firm's "busy season," which runs from September to March, and auditors didn't have time to learn its ins and outs.

Webb predicts that the graphics work with the Mac "will be a real sleeper for us. It's not one of the areas that we've pressed this year, but in the coming years, people will see that it will have some real benefits, in terms of being able to visualize and analyze what's behaving how with a particular client."

"The Apple III was too complex. It was for the power user," Marcon asserts. "The Mac is for the casual user. The only frustration I've heard is that once staff develops the expertise, they think it's too slow—they don't remember that they used to have to sit there with a calculator."

All the members of the audit group at Peat Marwick have received some kind of training on the Macintosh. Most of the training is what Webb calls "implemented self-study training." The first 15 to 16 hours of training usually takes place in a classroom, not necessarily as lectures, but as videotapes. Individuals pace themselves through the process, rather than being led by an instructor. "We have the classroom set up so you can turn to the person next to you, or to the instructor, and ask a question."

The first 13 hours familiarize the students with Basic Financial Statement software; the next three hours introduce them to Multiplan. After that, they spend 16 to 20 hours more on Multiplan and then perhaps a one- to two-hour group session of brainstorming and discussion, says Webb: 33 hours of required training in all.

Senior accountants receive even more training, including more intensive Multiplan work or ventures into the various Peat Marwick templates.

Because of the SeaCas program, Peat Marwick inadvertently got into the business of evaluating Macintosh financial software. As a result, says Webb, he's developed a good perspective on current financial packages for the Macintosh, and he's developed a few pet peeves.

According to Webb, a lot of companies aren't following the Macintosh user-interface guidelines. "They're trying to make their product unique at the exact wrong level—using their own editing conventions or not making use of the pull-down menus." Webb grimaces that he is still smarting from the effort Peat Marwick had to make so that its own software would conform to those guidelines.

Peat Marwick is working on additional templates and constantly evaluating software that comes across its desks from outside sources.

The reaction at Peat Marwick to the introduction of the Macintosh has been overwhelmingly favorable. Everyone seems to want one or access to one. "I'd expected a reaction like 'Oh, you ivory-tower types at the executive office are sending us something else we can't use,'" says Webb, "but I haven't heard that from anybody. In our firm, people don't use things if they don't pay off." +

Vanessa Schnatmeier is a free-lance writer who is particularly interested in the human side of computer use.

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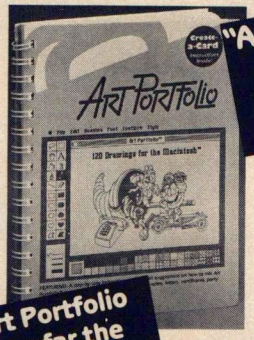

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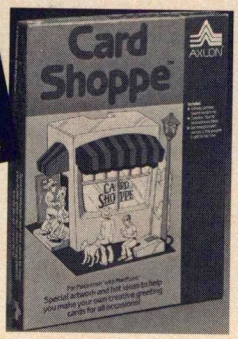

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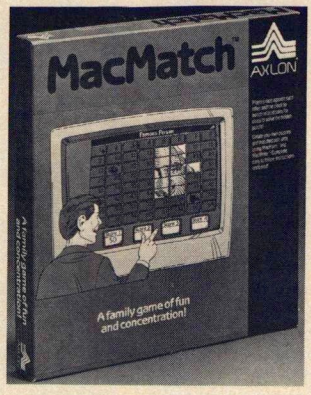

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TO C OR NOT TO C

Two C compilers for the Mac

Since we've looked at Macintosh assembly-language programming for the last few months, I think it's best to give equal time to some other languages that are appearing on the Mac scene. This month we'll look at two C compilers.

C is a language usually associated with the UNIX operating system developed by Bell Labs. Indeed, UNIX was written in C.

To the uninitiated, C looks remarkably like an abbreviated Pascal, but it is much more. C is better suited to low-level programming (e.g., operating systems and other programs that are usually written in assembly language) than is Pascal.

More to the point, C is much better suited to the Macintosh environment than is Pascal. I say this because you have to perform minor feats of magic in Pascal to address the pointers and pointers to pointers—*handles*, in Apple jargon—that the Macintosh ROM routines use. In C, however, manipulation of pointers is straightforward. Referencing a Macintosh handle in C is as simple as declaring a pointer to a pointer.

C gives you the same programming structures as Pascal does—do loops, for loops, while structures, and begin/end notation (written as curly brackets—{ }—instead of BEGIN and END). C also has a versatile battery of variable types, many of them similar to Pascal variable types. And, as in Pascal, C allows you to write your own functions and maintain a library of them for incorporation into your programs.

Many software developers have recently switched to the C language for program development. Microsoft's programmers, for example, do most of their programming on a minicomputer in C and then fine-tune the results when they port the code to a particular microcomputer. Ashton-Tate recently rewrote dBASE II in C, the result being dBASE III. MicroPro rewrote WordStar in C and released it as WordStar 2000. Other software creators working in C include Digital Research (of CP/M fame), Lotus Development Corporation (1-2-3), and Software Publishing Corporation.

Why are so many major software firms switching to C? Mostly because it gives them a structured language whose resultant code is almost as fast as assembly-language code. Almost as important, C code has a reputation for versatility—you can easily rewrite programs you wrote for one machine for use with another, without having to start from scratch. C is also known for small, fast programs.

With this background in mind, let's take a closer look at two Cs for the Macintosh.

A Hippo of a C

My personal favorite of the two Cs currently available for the Macintosh comes from a company with a rather intimidating name: Hippopotamus Software.

For your money you get a 5×7-inch binder packed with documentation and a single copy-protected Macintosh disk.

The manual reads easily; gives a simple, if not eloquent, explanation of Hippo-C; and includes documentation on how to use many of the Macintosh ROM routines from Hippo-C. The second half of the manual is a listing of the on-line tutorial available in Hippo-C.

A good C compiler consists of the full implementation discussed by Kernighan and Ritchie in their book *The C Programming Language* (Prentice-Hall, 1978). Hippo-C seems to be a full K&R implementation. The C library included with Hippo-C con-

tains the usual file routines (fread and so on); fprint; scanf; string-manipulation functions (strcat and so on); the usual is_ functions; and even the memory functions malloc, calloc, and free. In my short experience with Hippo-C, I've yet to find any deviations from K&R's definition of C, other than the extensions the Macintosh requires.

The Macintosh ROM functions that come with Hippo-C work as expected, although the documentation needs better information about what types of variables each function expects (the manual suggests you consult *Inside Macintosh*, but remember that Pascal and C data types are not necessarily always treated the same way).

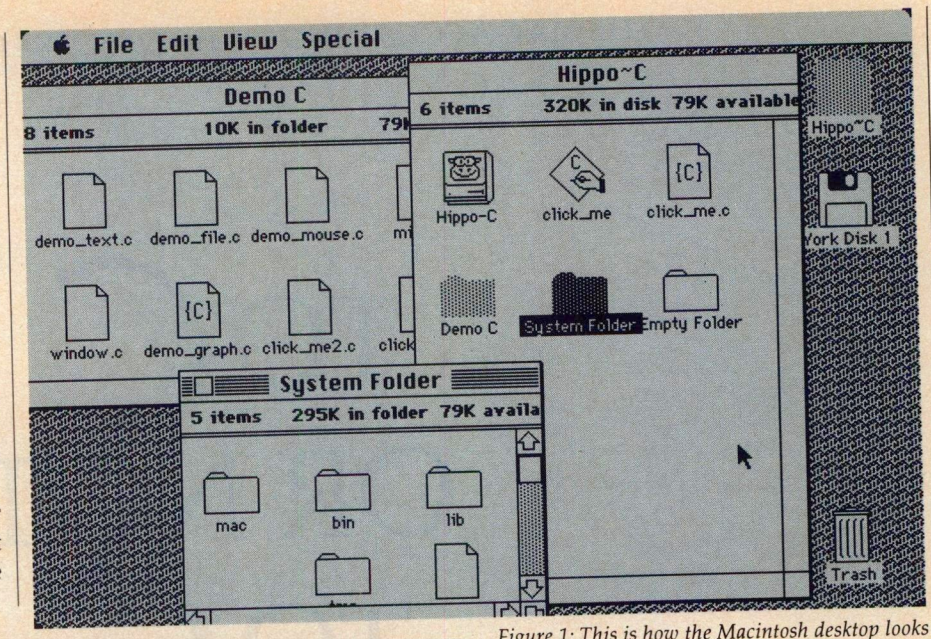

Figure 1: This is how the Macintosh desktop looks with the Hippo-C compiler active.

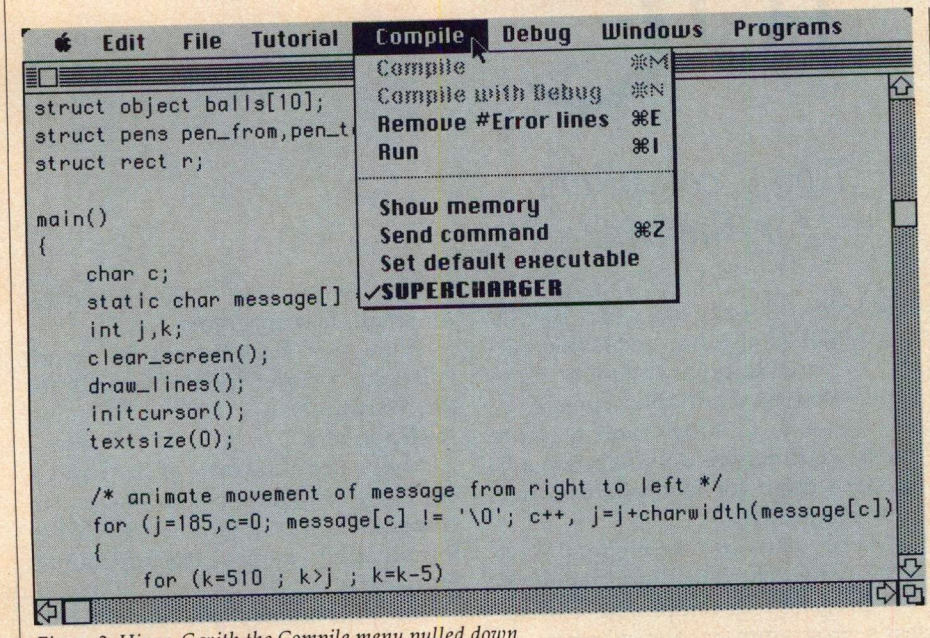

Figure 2: Hippo-C with the Compile menu pulled down

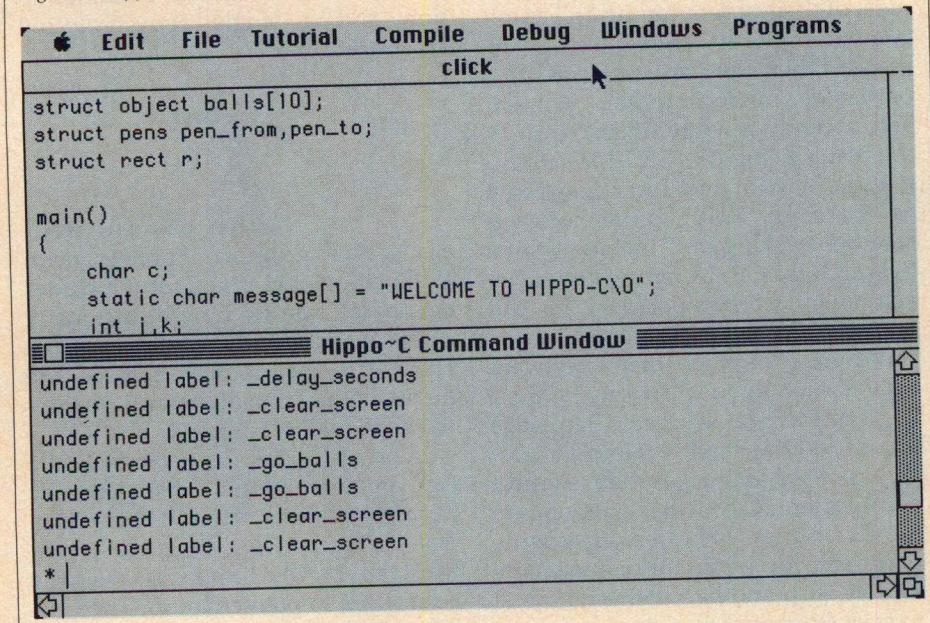

Figure 3: The Hippo-C compiler gives you messages.

Figure 1 shows the Macintosh desktop with Hippo-C active. It looks reasonably Maclike, but looks can be deceiving.

Apparently Hippo-C is written in an operating system known as—you guessed it—Hippo Operating System, or HOS. HOS looks like a scaled-down UNIX for the Macintosh. You edit your program using a MacWrite-like editor and then save it, just as you'd expect. Next, you pull down the Compile menu and select the Compile option (see figure 2).

All this time you've actually been working in a "shell" around HOS, which you'll discover when you begin compiling and get messages from the compiler (see figure 3).

The Hippo-C icon on the Macintosh desktop turns out to be a 2K file that starts up that shell. So, although your programs in Hippo-C Level 1 look like Macintosh applications, they're actually not. No problem, I suppose, but a bit disconcerting to Macintosh users at first.

Level 2 to Come

Hippopotamus has announced a Level 2 C compiler for early 1985. It will create stand-alone, double-clickable application programs much larger than what the Level 1 compiler allows (Hippo suggests that Level 1 programs be limited to 200 lines of

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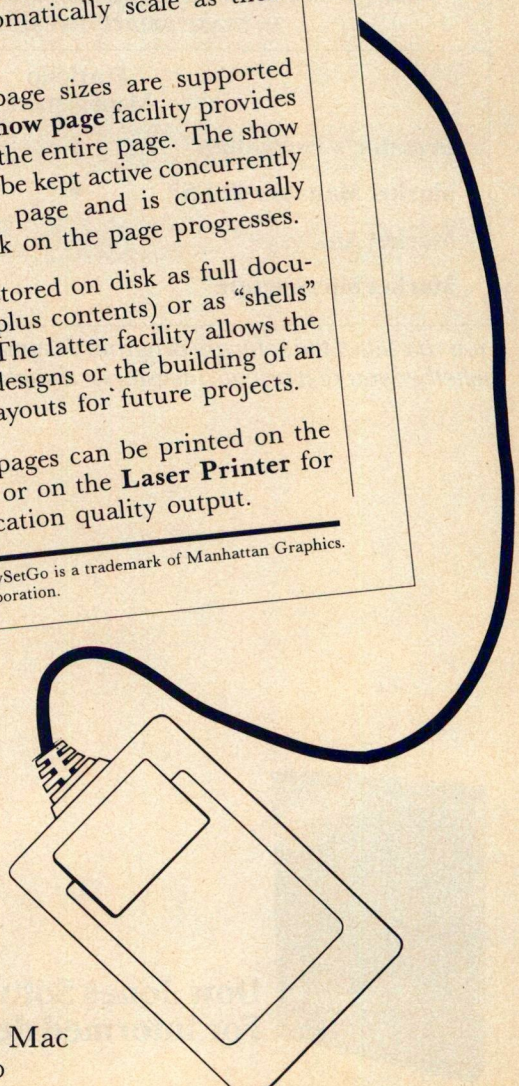

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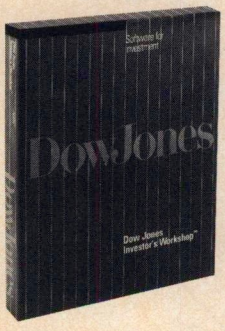

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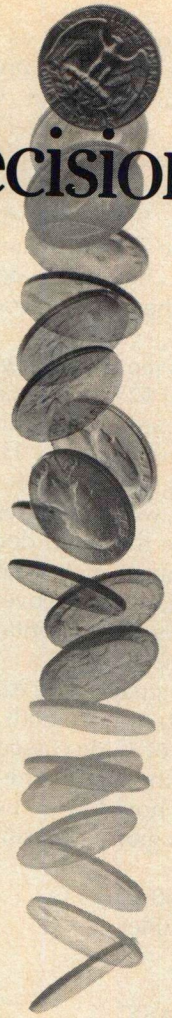

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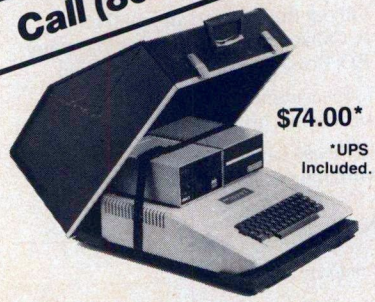

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code in each linkable module). Also included in Level 2 are floating-point functions, an assembler, and an optimizing compiler.

Softworks C

Another C compiler available for the Macintosh is Softworks C.

Softworks C is an adaptation of Whitesmith's 68000 C, a well-known and respected implementation, albeit not necessarily the fastest C compiler around.

The Software C version that I tested was a preliminary version, and it showed. Softworks Limited is selling this "prerelease" version at the same price as it will ask for the eventual release version. Early buyers get one free update, plus low-cost updates later on. Included with the prerelease version of Softworks C that I received was a beta-test copy of the Apple assembler.

The package I received consisted of three unprotected, unlabeled disks and mimeographed documentation in a three-ring binder. The documentation consists primarily of a reprint of Whitesmith's C manual, but not all of this manual is appropriate to the Macintosh version of the language (Softworks includes documentation on portions of the language appropriate only to UNIX).

All of this doesn't sound overly professional, but the compiler itself certainly is. You create your C source code with the editor that comes with the Apple assembler (Edit). Next, you run the compiler, whose icon looks like a factory. The compiler makes three passes at the code (the Hippo-C compiler seems to be a two-pass compiler), creating an assembly-language file. You then use the Apple assembler and linker to create an executable program.

I rearranged the files Softworks provides to create four disks that were more compatible with the way I work, but you can get by with the three that Softworks provides.

Because Softworks C uses the Apple assembler, using the resource compiler to combine C program code and your resource file—a problem with the Hippo-C Level 1 compiler—is easy.

A nice touch is that Softworks supplies as much source code as it can with the package (the firm is prohibited from providing any of Whitesmith's source code). The ROM interface routines are supplied in source code, as are some of the other library routines. Since Softworks C also creates true assembly-language code, you'll also be able to do some fine-tuning on the program code that you create.

Whitesmith's requires that you pay a one-time fee of $25 for any program you create with Softworks C that you sell or distribute to others. Hippo-C has no licensing fee, however.

Softworks C would be great with better and more thorough documentation. As it stands, it is usable, although you'll have to discover many of its nuances by experimentation.

C What I Mean?

Of all the languages I've examined so far for the Macintosh, both the implementations of C discussed above come right at the top of the list. At present, here's how I rank the different ways to program a Macintosh:

1. MacForth
2. Hippo-C/Softworks C
3. Apple assembler
4. MacPascal
5. MacBASIC
6. Microsoft BASIC
7. Lisa Pascal

If you're a beginning programmer, look to MacPascal, MacBASIC, or Microsoft BASIC, but if you're an experienced programmer, take a close look at these C compilers. +

Thom Hogan is editor-in-chief of Business Software *and has written numerous computer books, including* InfoWorld's Essential Guide to the Apple II.

PRODUCT INFORMATION

Hippo-C
Hippopotamus Software
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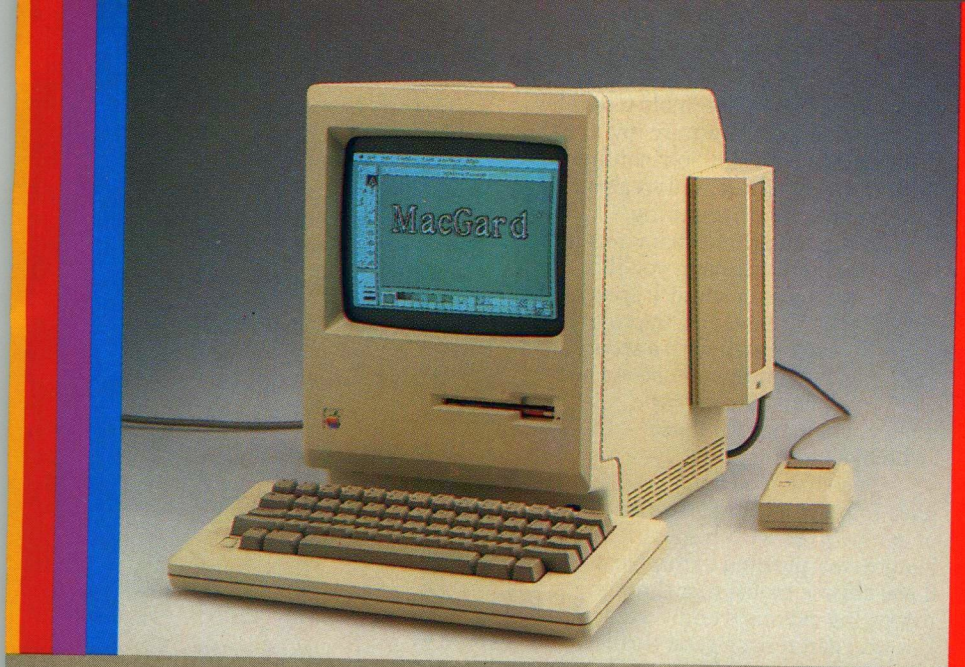

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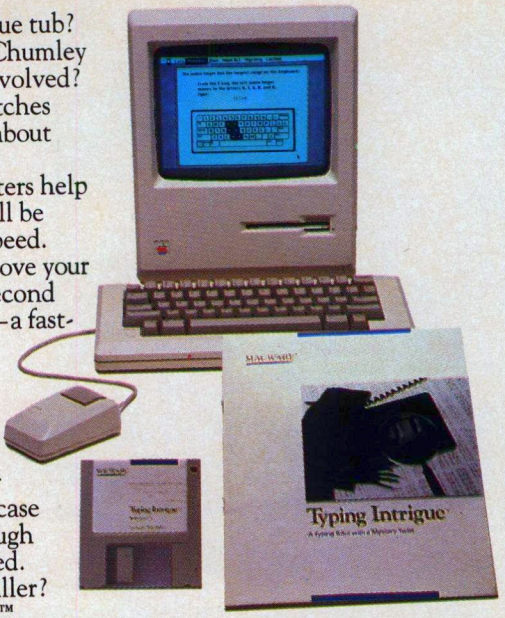

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Part II
Pascal Primer
for the Macintosh

This month we are bringing you the second part of our two-part excerpt from the Waite Group's Pascal Primer for the Macintosh *by Dan Shafer, which is being published by New American Library under the Plume/Waite imprint in 1985. Last month's excerpt, "Your First Pascal Program," showed you how to write a simple Pascal program on the Macintosh. This month's excerpt, chapter 3 of the book, delves further into the Pascal language and explains important elements of Pascal programming.*

Anatomy of a Macintosh Pascal program

This chapter introduces two crucial Pascal programming concepts: structure and variables. Mastering these concepts will make learning the rest of the language easier. Structure and variables are used very differently in Pascal than they are in BASIC. Thus, nonprogrammers sometimes have an advantage over BASIC programmers when it comes to learning Pascal—they have nothing to unlearn.

SOME ELEMENTS OF PROGRAM STRUCTURE

Any Pascal program has a defined structure or format that contains a number of elements. To begin with, we'll focus on the three simplest and most obvious elements of Mac Pascal program structure.

Now, fire up your Mac, get Pascal running, and let's get started! Make sure your screen looks like figure 1.

Before we do anything else, take a quick look at your Macintosh Pascal desktop. Notice that three components are already provided in the Program window. One line says *Program* and is now followed by the word *Untitled*, which calls our attention to the first element of Pascal program structure, which involves the necessity of naming things such as programs.

The second thing you may notice is a line in the window suggesting that you're going to give the program some *declarations*. These are the second basic components of program structure that we'll look at in this chapter.

Finally, there are two Pascal keywords shown in boldface type: *Begin* and *End*. These two words are separated in the Program window by this line:

```
Your program statements
```

This line suggests that between the *Begin* and the *End*, you're going to be typing one or more program *statements*. This pair of statements—Begin and End—is the final major component of Pascal program structure we'll be looking at during this discussion.

Now let's move to the first program-structure component: naming things in Macintosh Pascal.

GIVING YOUR CREATION A NAME

When you create a program in the window labeled Untitled, get rid of the unceremonious name Untitled by naming your program.

What's in a Name?

A program name is actually a Pascal *identifier*. Macintosh Pascal uses identifiers throughout programs to identify things such as constants, types, variables, procedures, functions, programs, and fields within records.

There are three simple rules for identifiers in Pascal. They apply to program names and to all other identifiers.

Start with a Letter

First, identifiers must begin with a letter. That rules out the use of numbers and all special symbols as the first character in a Macintosh Pascal

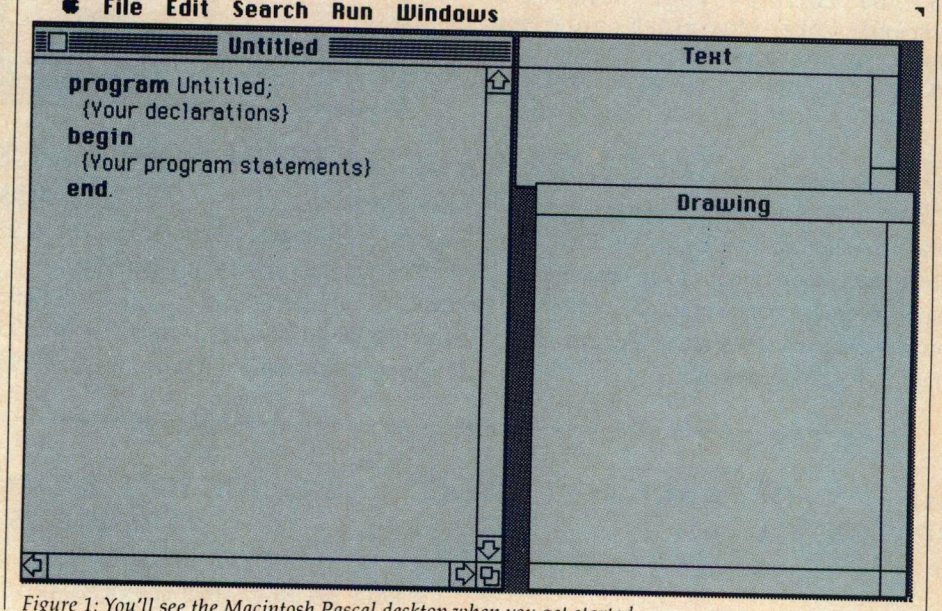

Figure 1: You'll see the Macintosh Pascal desktop when you get started.

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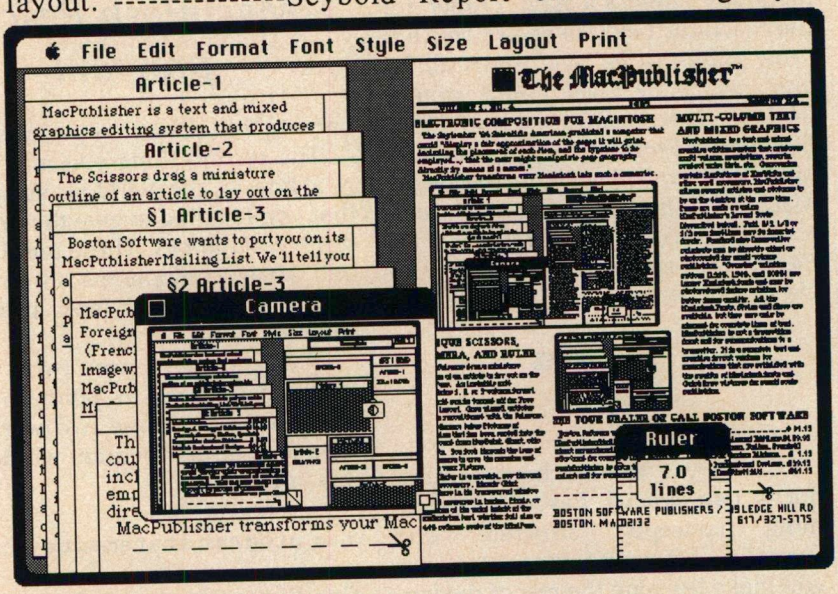

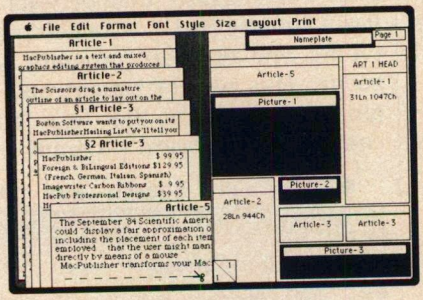

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```
An_identifier_naming_a_job_I_did_last_month
An_identifier_naming_a_job_I_did_last_week
```

Figure 2: Two Macintosh Pascal identifiers—note the absence of spaces.

identifier. Special symbols are characters such as @, %, and &, which cannot be called either letters or numbers; there are many such special symbols on the Mac. Numbers may be used in identifiers, but they may not be the first character. Special symbols should not be used at all.

No More than 255 Characters

Second, an identifier may contain up to 255 characters. Macintosh Pascal is far more generous in this regard than most implementations of BASIC and Pascal on home computers, which place severe restrictions on names. In fact, early versions of BASIC for personal computers would permit identifiers in a program to be only *one letter* long! Even today, many versions of Pascal allow identifiers with no more than eight characters. Some versions of BASIC have two-character limits.

So what? Well, it's hard to remember, six months after we wrote a program, that the identifier called N1 meant *first name* and the one called N2 meant *last name*. For all we know, they might have meant *nest*, *nerd*, or even something entirely unrelated to the letter *N*. But we would have a hard time being confused by a program named First Name or Last Name.

Mac Pascal shows its generosity about names in another way, too. Each character of the 255 is significant or meaningful to Macintosh Pascal. This is a contrast to some other systems, which allow a long string of characters in identifiers but count only, say, the first two as significant. Such systems will read the identifiers Mycat and Mydog as the same thing. Mac Pascal won't. In Macintosh Pascal, even the two identifiers in figure 2 would be differentiated from one another.

Macintosh Pascal's design allows us to use meaningful words and terms as identifiers. Take advantage of its generosity and give meaningful names to all the things in your programs that need identifiers. Doing so will permit easy understanding and modification of the programs in later weeks or months.

No Spaces Allowed!

The third rule about Macintosh Pascal names is that each one must look like a single word. Notice that in the two very long names in figure 2, *no spaces* were left between the parts. Instead, underlines connected them. All the words could have been run together, as in Anidentifiernamingajobididlastmonth, but that would have been far less readable. It's better to break up long names with underlines, or with capital letters as we do in this book (AnIdentifierNaming . . .). In any case, never use spaces. Mac Pascal will break an identifier with a space in it into two names at the space. Strange things will then happen as the Mac tries to do something with the second "name."

COMMENTS: WHAT THOSE FUNNY BRACKETS ARE FOR

The next part of the program skeleton contains the words *Your declarations* between two funny-looking curly brackets. We can put anything we want between two curly brackets in a Pascal program, and the program will simply ignore it all. "But, wait!" you may be saying. "What good does it do to put something into a program that the program is going to ignore?" Good question!

The brackets permit us to include, inside the program, notes to ourselves and to others who may want to know how the program works. These notes, called "comments," describe what is going on in the program. Get accustomed to using them frequently and liberally in programs you intend to save for later use. Use them especially in longer programs, where they can describe what the various sections do and how they do it.

For reasons that will become clearer in a few moments, we're going to save our discussion of the section of the program hinted at by the phrase "Your declarations" until *after* we've discussed the third major program-structure element: the Begin-End pair.

Begin at the Begin

The Begin-End pair is an important structure in Pascal programming. All the parts of a Pascal program that *do* things must appear between a Begin statement and an End statement.

In the program on the Pascal desktop you see two Begin-End pairs. Most Pascal programs contain several Begin-End pairs. You can recognize where each part of a program begins and ends by looking down the program listing and finding the pairs. The Begin-End pair structure is intuitive (that is, it feels "natural" to talk about program sections that begin and end) and also quite useful. It is one of the features that has made Pascal such a popular language.

What if You Break the Rule?

Let's take a look at what will happen if we forget this Begin-End-pair rule in writing a Pascal program. The result will be instructive.

First, go back to the desktop that looks like figure 1. The easy way to do this is simply to quit Pascal from the File menu and then reselect the Mac Pascal icon from the main Macintosh desktop.

Now press Return seven times so the whole Pascal program skeleton

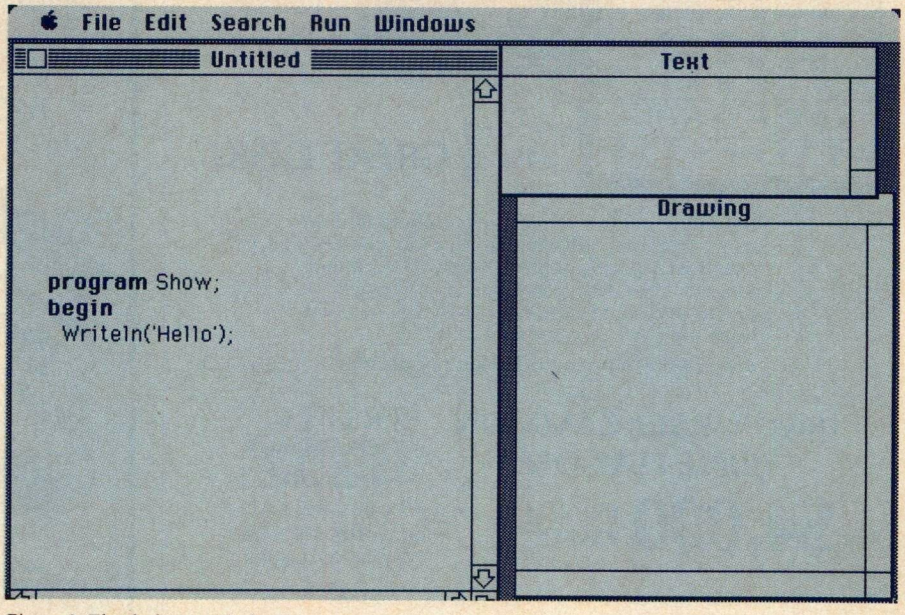


Figure 3: The desktop with the Show program typed in

moves down in the Untitled window. You're doing this because we're going to cause a Bug box to cover up part of the top of the screen, but we still want to be able to see the program.

Now type the following program, inserting it in the appropriate place in the program skeleton. It's a good idea to delete the comment lines contained between the curly brackets (although leaving them in place doesn't harm anything).

```
program Show;
begin
Writeln('Hello');
```

Be sure the desktop looks like figure 3. Find the Begin. Notice that there is no End in sight.

OK, are you ready for our first bold, revolutionary attempt at breaking the laws of Pascal? Run that program, using the Go option from the Run menu. (From now on, any time we say "Run the program," we mean use the Go option from the Run menu.)

If all failed as expected, the Mac beeped, and a new box appeared at the top of the desktop, saying

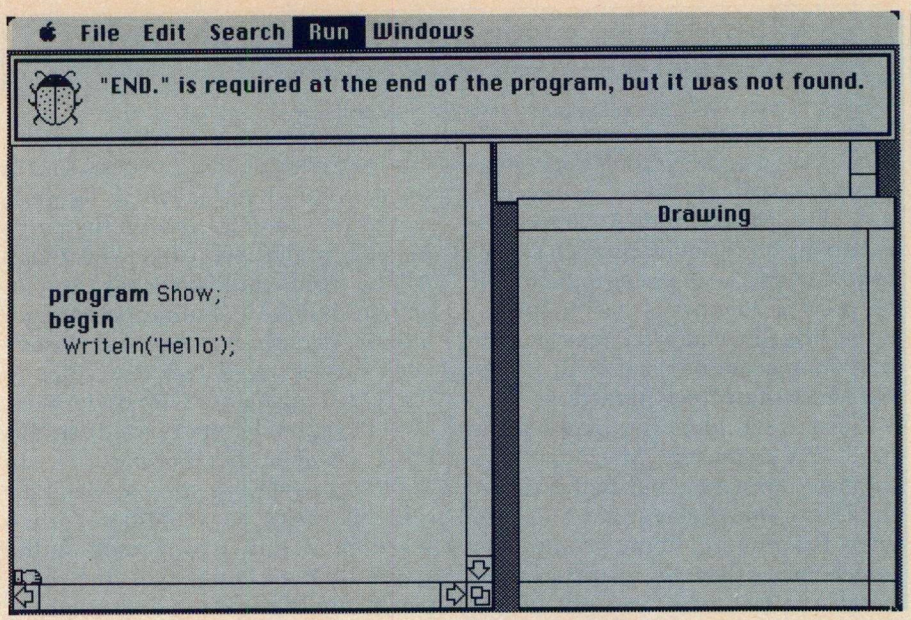


Figure 4: Macintosh Pascal's way of showing you that the program had a bug

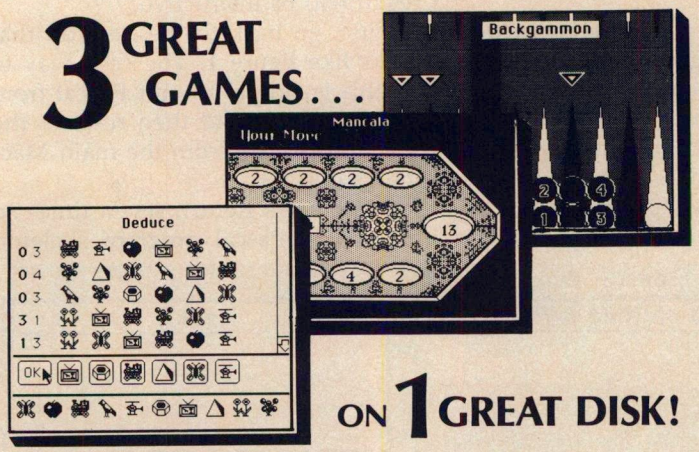
```
Not a valid executable state-
ment
```

Figure 4 shows two strong hints that Pascal didn't understand something.

The Dreaded Bug Box

The new box at the top of your desktop is called a Bug box; it even has a little bug in it. Make the Bug box go away (by clicking anywhere inside the box) so we can fix the bug. The "thumbs down" sign will stay in place until you begin editing the program.

Go into the Program window and add the word *End.* to the program. (Be sure to include the period, or you'll get another Bug box.) *Now* run the program, and everything should be fine. You should end up with a screen



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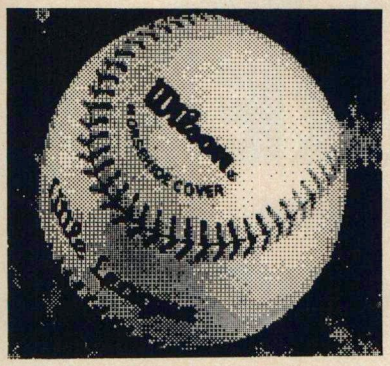

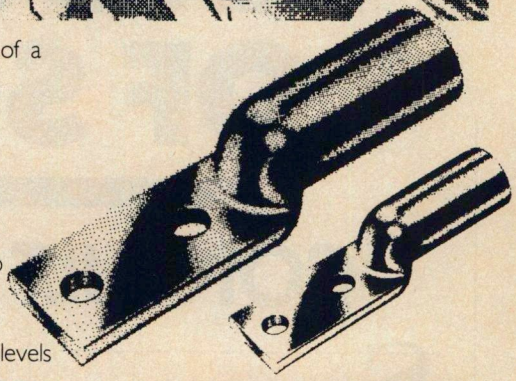

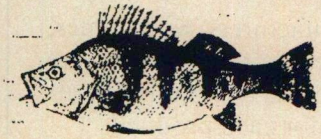

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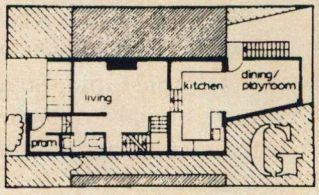

Color change--for instance, the use of a single hue in an achromatic

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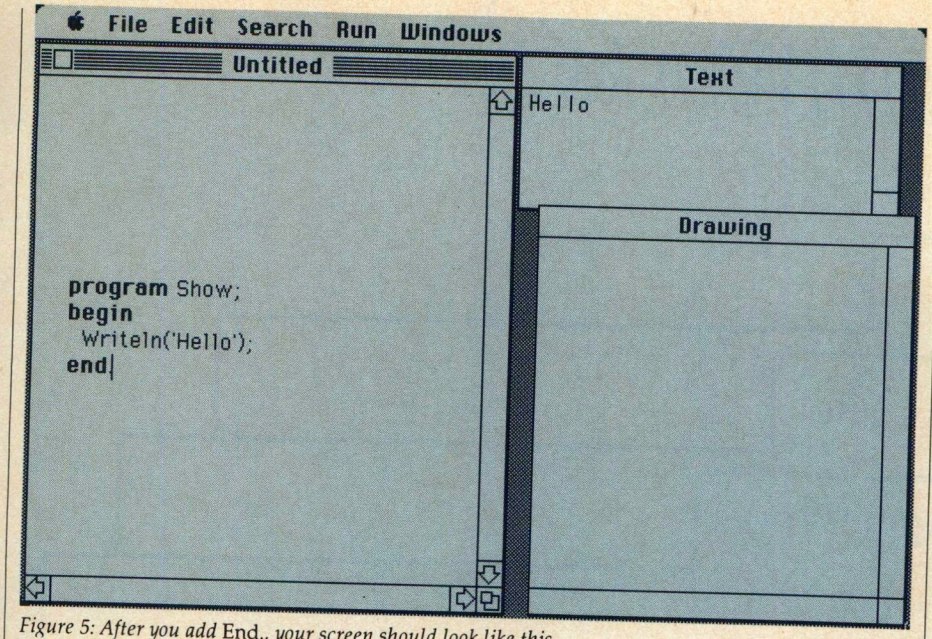

Figure 5: After you add End., *your screen should look like this.*

that looks like figure 5, above.

The Rules, Then, Are . . .

Every Pascal program will have a minimum of one Begin-End pair. Most programs will have several or even a great many such pairs, marking the starting and stopping points of various groups of Pascal statements. Anywhere a Begin is needed, an End must also be present.

Now we're ready to move on to a discussion of the last major component of Macintosh Pascal program structure: declarations.

Anything to Declare?

Let's return now to the section of the Macintosh Pascal program that begins with the comment line about "declarations." What are we supposed to declare here?

We must "tell" Macintosh Pascal about any names we're going to use during the running of a program *before* we use them. The process of informing Pascal about names before they are used is called declaration. As we move through our Mac Pascal adventure, we'll see that we can—and, in fact, *must*—declare things of many different types before we can use them.

Variables

The most common kind of name we'll be defining in our Pascal programs is an item called a variable. We warn Pascal that we're about to declare a variable (or several variables) by typing in the keyword *Var*. In this case, we'd type Var right after the statement that names the program.

Before you can declare any variable, though, you need to understand what a variable is. The idea of variables is simple, though it is often made unnecessarily complicated. In fact, we've all used variables hundreds of times, perhaps without being aware of them.

Let's explore variables briefly before we get involved in an explanation of them. To begin, use the File menu to close the program at which

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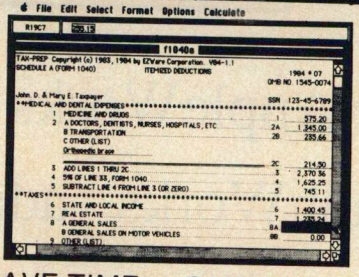

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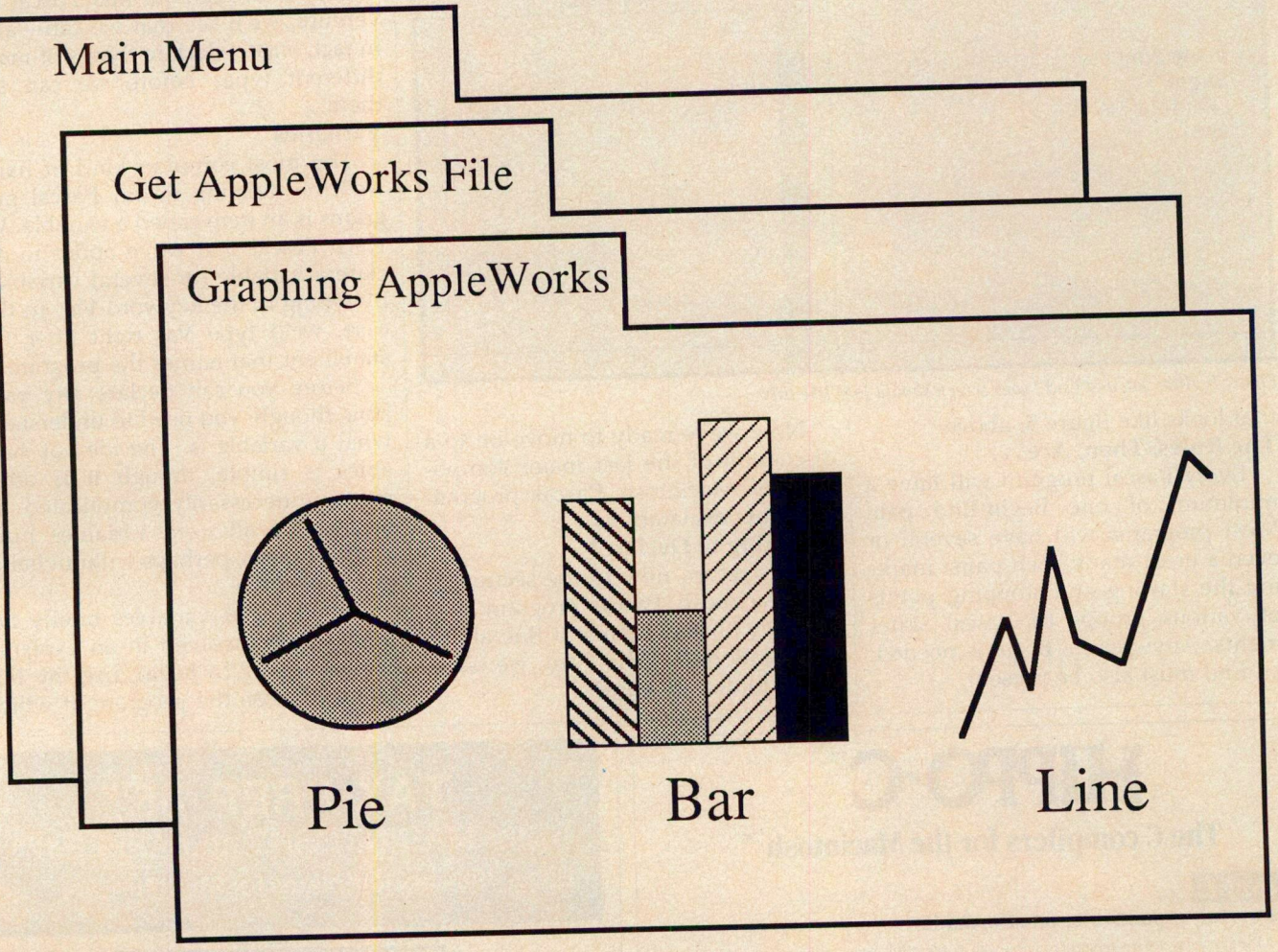

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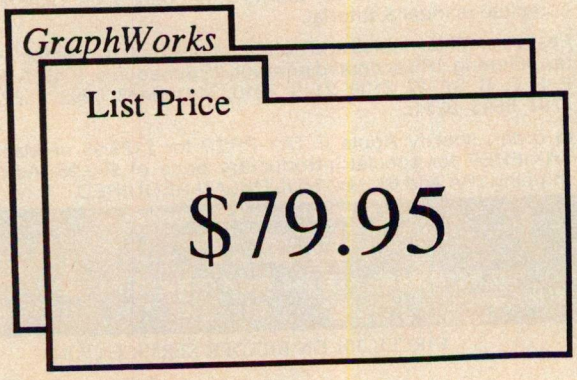

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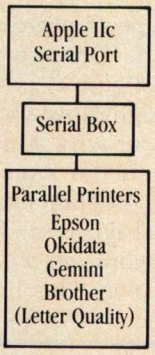

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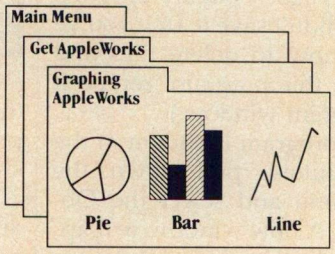

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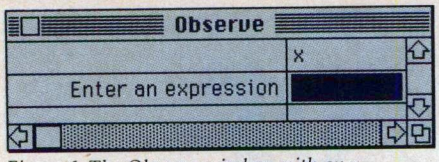

Figure 6: The Observe window with an x

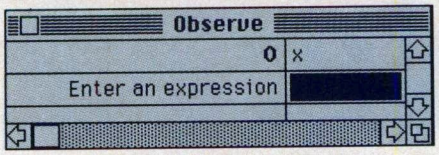

Figure 8: Observe while you single-step

we've been looking. Discard the changes, since you won't be working with this program again. Now open the program from chapter 2 (see *A+*, March 1985, page 97, figure 2) called First. (If you didn't save it, or if you've figured out how to delete files and have deleted this program, retype it into the Program window.)

Once the program is shown in the Program window, pull down the Windows menu and select the Observe option. A new window will appear on the display. The window is divided into a small grid pattern, one section of which contains the message Enter an expression. The pointer is now in the small box to the right of that message. Type a lowercase *x* and press Return. The Observe window should look like figure 6.

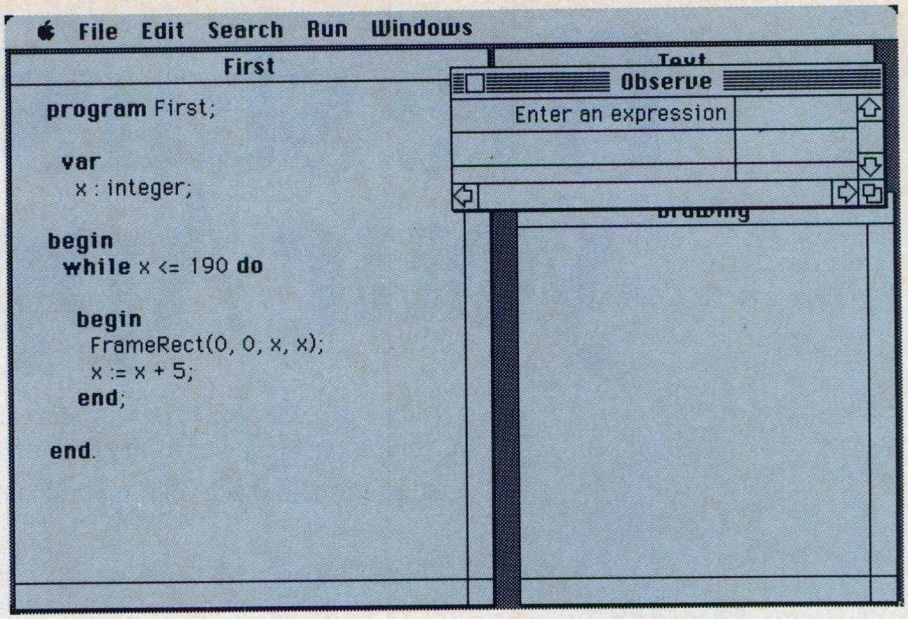

Figure 7: The First program—note the variable declaration under var.

Don't worry right now about what an expression is or why you entered *x*. Just notice the letter *x* on the line below Var in the program listing (just like the *x* you just typed in), followed by a colon, the word *integer*, and the inevitable semicolon. This line is the first variable declaration we did together, though we didn't call it that at the time (see figure 7).

Use the Run menu Single Step option or the ⌘S combination to single-step through the program. When you begin, the pointing finger will show up at the line that says Begin, and the Observe window will change so it looks like figure 8.

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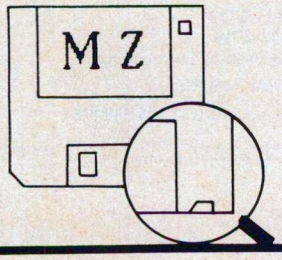

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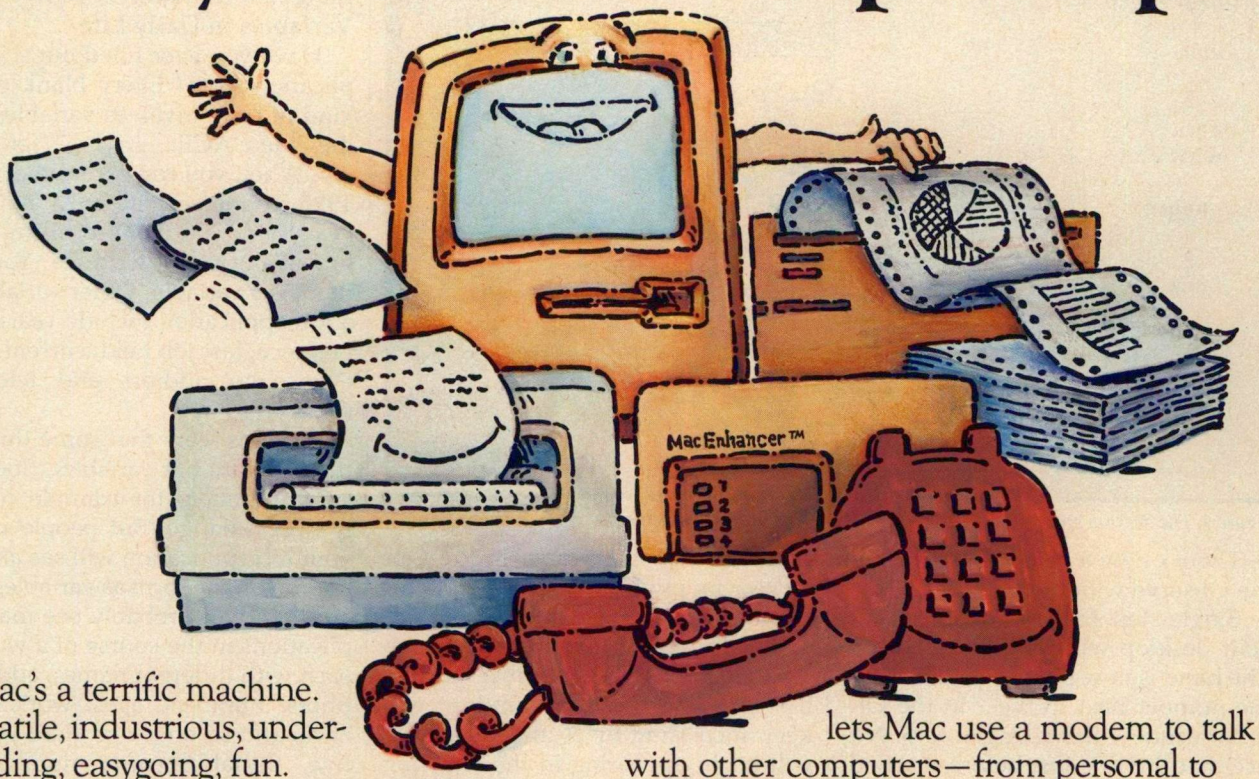

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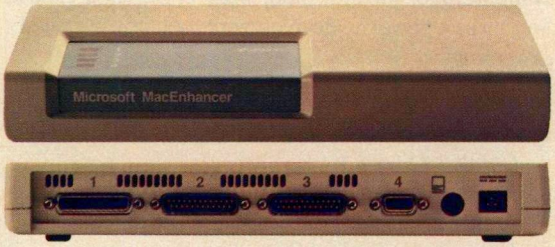

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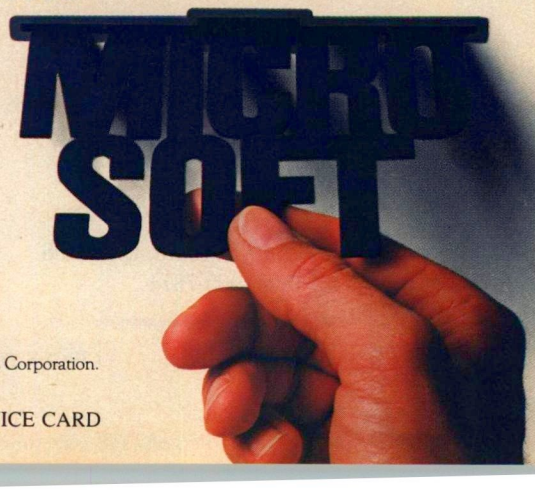

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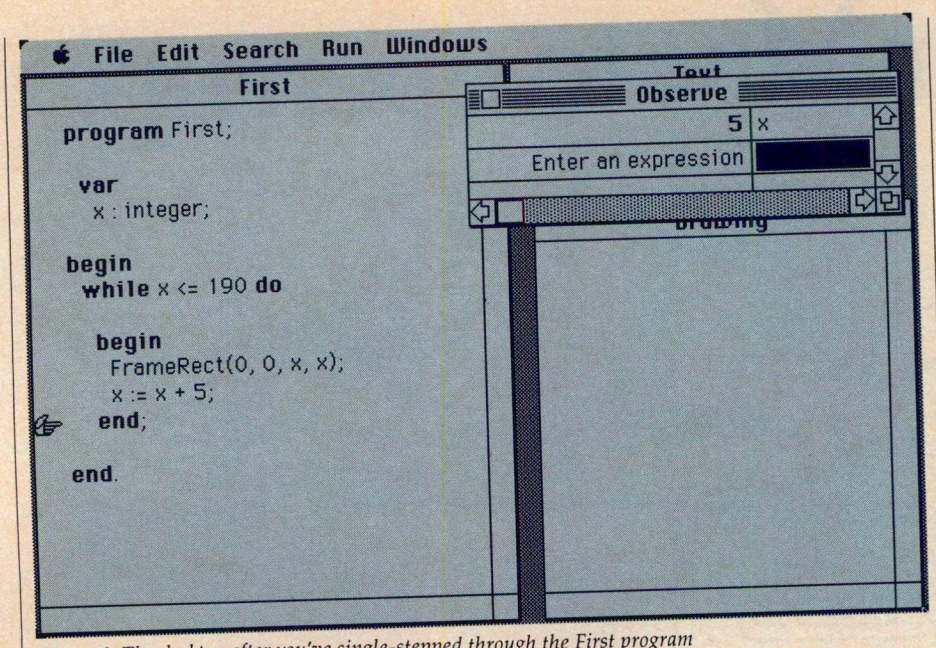

Figure 9: The desktop after you've single-stepped through the First program

There's now a zero next to the *x* in the Observe window.

Single-step five more times, and your desktop will look like figure 9. The hand is now pointing at End; and the number next to the *x* in the Observe window has changed to 5. Notice that the line just before the End; statement says x:=x+5. This means we're adding the value 5 to *x*, which explains why its number in the Observe window has gone from 0 to 5.

Hold down the ⌘ and S keys together for a few seconds and watch what happens. The number next to the *x* in the Observe window will keep increasing by 5, and rectangles will begin appearing in the Drawing window. Pretty soon the screen will look like figure 10.

Are you beginning to understand variables from the way *x* is behaving in this program? A variable is something that changes.

Variables in Daily Life

Have you ever filled out a job-application form? Every blank on that kind of form involves variables. Take the line "AGE:____yrs.," for example. When you run across that line in 1985, you may write in 23, but if two years later you have to fill in such a line again, you'd write 25. Your age, then, is a variable. Other variables on a job application include years of experience, last job held, current salary, even your address and telephone number.

It might seem that some things on the form are not variables. Social Security numbers, for example, normally don't change. But people reading your job application will see *all* information on the form as variables. After all, they will probably see many applications in the course of a workday, each with different names, addresses, phone numbers, ages, work experience, and so on. From their perspective, Social Security numbers are variables.

Basically, we can say that a vari-

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able is anything that can change. For computers, we can refine the definition by saying that a variable is anything that changes *from the program's viewpoint.*

Variables are one of the things we must tell Pascal about (that is, declare) before we begin a program. If we use a variable we haven't declared, the program containing the variable simply will not run. Some people think this requirement is good for programmers' souls in that it forces a measure of discipline and planning into the programming process that is not always required by other languages.

Sorry, You're Not My Type

Pascal also requires us to decide in advance the kind or *type* of variable we want. We must declare the variable type as well as the variables themselves near the beginning of the program. Letters and numbers are different variable types. To see why, you need to understand what letters and numbers mean to a computer.

All higher-level computer languages deal with information as either numbers or letters (individual letters or groups of letters in the form of words and phrases). Computers must be able to tell the two kinds of information apart, because they can't process letters in the same way they do numbers. Suppose a computer tried to add *two* (a word) to *5* (a number). Would it get two5 or 7 or 25? Adding the two just doesn't make sense, and even your cooperative Mac will refuse to try it.

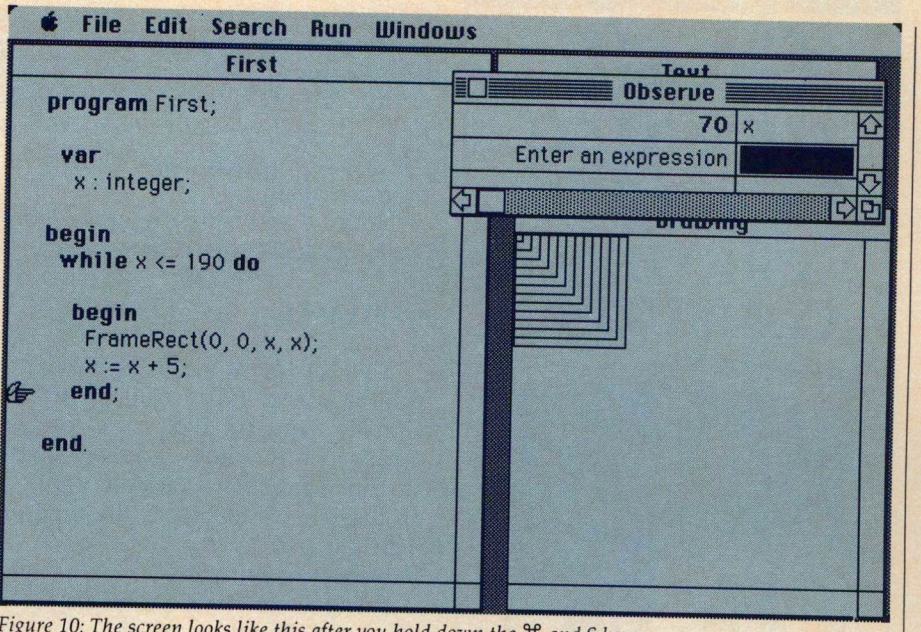

Figure 10: The screen looks like this after you hold down the ⌘ and S keys.

How Do You Declare a Variable?

Declaring a variable in Macintosh Pascal is easy. Simply determine the type of the variable you want to define (we'll tell you how to do that later in this chapter), give the variable a name, and put the name and type declaration together in the variable-declaration section of the program. To

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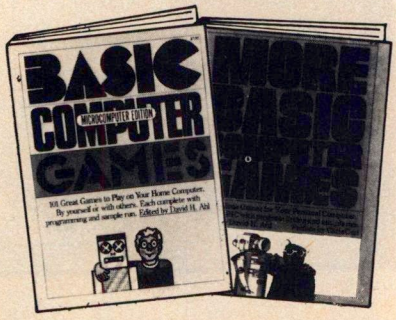

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```
var
  Name,DepartmentName:String[125];
  Payrate,Hours:Real;Code:Char;
```

Figure 11: A set of combined variable declarations

see what we mean, look at the First program again.

Notice the line just under the word Var in the program. It says

```
x:Integer;
```

This statement has three parts: the variable name (x), a colon, and the variable type (in this case, integer, which means whole number—more on that soon). The variable name is on the left of the colon, the type on the right.

Variables in Bunches

It is possible to use a single statement to define the type of more than one variable. For example, to define three whole numbers, just type

```
x,y,z:Integer;
```

This statement defines three variables, which are separated by commas. It declares them all to be of the Integer type. It is the same as typing

```
x:Integer;
y:Integer;
z:Integer;
```

Combining several variable declarations on a single line makes typing and reading easier. It's good practice to group variables by type.

Meaningful Names—A Reminder

Variable names need not be limited to a single character. In fact, they shouldn't be. The names in our example would be much better if they referred to things the variables stood for in the program. For instance, we might write the line like this

```
Rectangles,Ovals,Lines:Integer;
```

Let's look at another example. Suppose you want to write a program that requires variables to store a name, a pay rate, a number of hours, a one-character code that tells what kind of job the person is doing, and the name of the department in which he or she works.

If we tell you that name is a variable with the type String, pay rate is of type Real, number of hours is Real, the code is of type Char, and the department name is of type String, what do you think that the variable-declaration statements would look like? Try figuring it out on your own before you read on.

Figure 11 shows how we would handle the variable declarations we just gave.

The order in which variables are defined and the names they are assigned are arbitrary.

Did you notice the number 125 in brackets after the word *String* in the first variable-declaration statement? A number in this position tells Pascal the maximum number of characters to be assigned to the variable named on that line. The largest string vari-

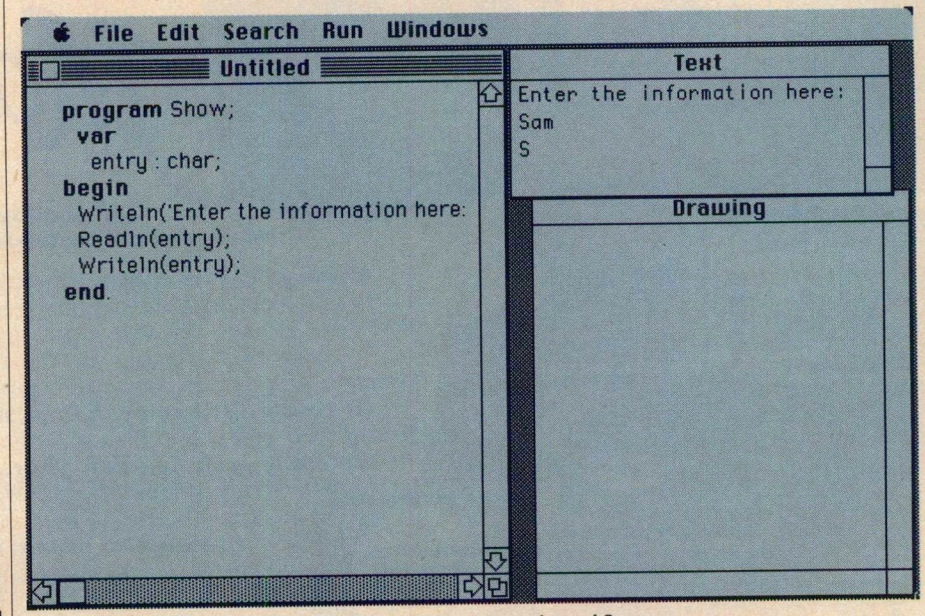

Figure 13: The screen after you've checked the program and typed Sam

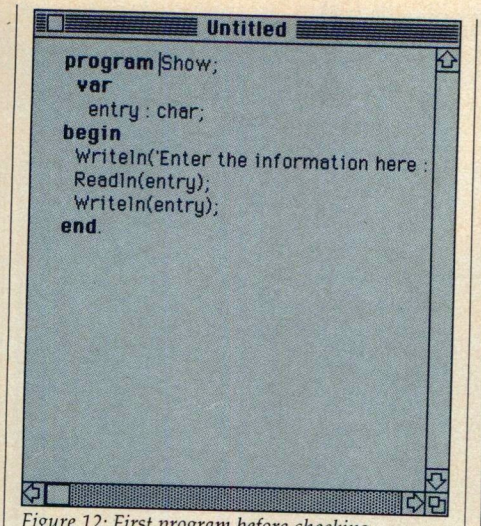

Figure 12: First program before checking

able allowed in Macintosh Pascal is 255 characters long, just like the largest identifier.

Types of Variables

One of the most powerful features of Macintosh Pascal is the richness of the types of variables we can use when we write programs in it. Check the *Macintosh Pascal Reference Manual* for a description of all the variable types available. Here we'll discuss only the four most useful ones: Char and String for letters, words, phrases, and sentences; and Integer and Real for numbers.

Quite a CHARacter

At the main Macintosh Pascal Desktop (see figure 1) type the program in figure 12.

When you've entered the program, use the ⌘K combination (which is a shortcut way of invoking the Check option from the Run menu) to check it for acceptability to Macintosh Pascal. Be sure the cursor is at the end of the word *program*, as shown in the figure.

Save the program if you wish; then run it. The Text window will display the message Enter the information here:. The pointer will then appear on the next line, and the program will wait for you to type something. Type the word *Sam* and press Return. The screen should look like figure 13.

Notice that only the first letter of what you typed is displayed by the program in the Text window, even though the whole word appears where you typed it.

Is there a limit to the *kinds* of characters Char will hold? Try typing a single number, such as 9. Does that work? What about a special symbol, such as an exclamation point? Or a *really* special symbol like the filled-in

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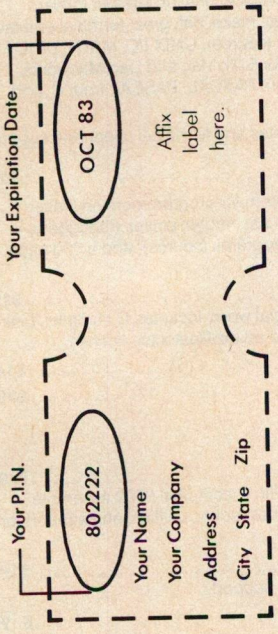

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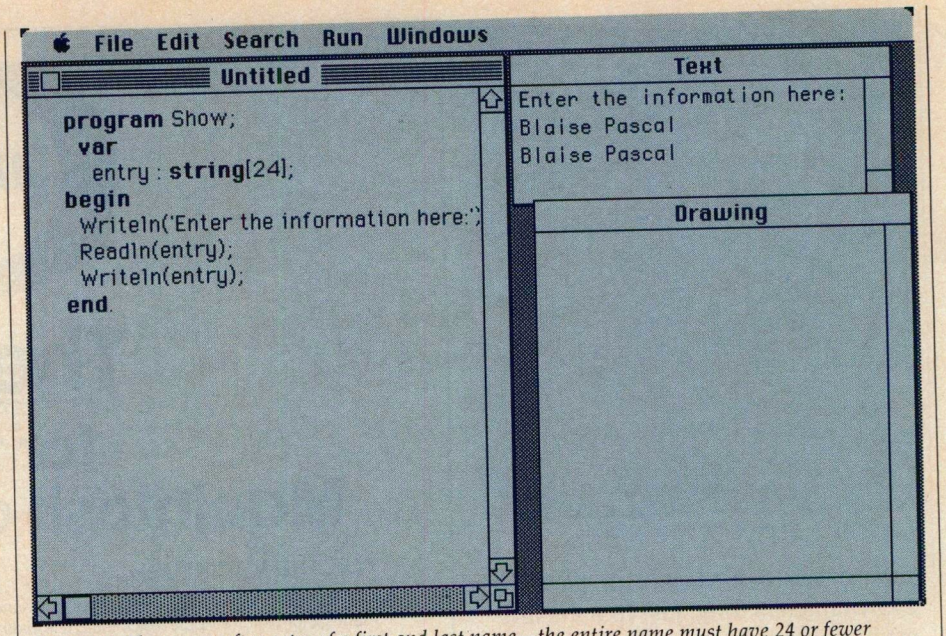

Figure 14: The screen after entry of a first and last name—the entire name must have 24 or fewer characters.

circle called a bullet (made by holding down the Option key and the B key together)?

Longer Groups of Letters and Numbers

The Char type of variable has a limited value. Programs often need information in the form of words, sentences, and phrases. In those situations, you'll want to define a variable or variables as the type called String.

As you've seen, a declaration for a variable of type String may specify a length limit in number of characters. If we don't tell Pascal anything about the length of a String variable, it will assign the maximum 255 characters as the limit.

Go back to the program now and change the line that says

```
entry:Char;
```

to read:

```
entry:String[24];
```

Now run the program again, typing in your first and last name (if they comprise 24 or fewer characters), with a space between them, just as you would on a typewriter.

The screen should look something like figure 14 (although if your name is *really* Blaise Pascal, it would probably be a good idea to use an alias!). The program will accept anything you type, up to 24 characters (since that was the specified limit of the string), and will display it in the Text window.

What if you type something longer than 24 characters? Try it and see.

If you tried it, you got a Bug box that said, String too small for assignment. Now that you know what happens, get rid of the Bug box, reset the program, and move on to the next topic.

Integers: Numbers of the Simplest Variety

Now let's turn to the world of numbers. Of the many types of numbers recognized by Macintosh Pascal, the most common is the type known as an integer. An integer is commonly called a "whole number"—that is, any number, positive or negative, that has no decimal points or fractions. The number 13 is an integer; the number 3.1416 is not.

The Biggest Number Is . . .

Change the program line in our test program from String[24] to Integer. Be sure to delete the brackets and the number 24. Now run the program and try putting numbers in. Try some big ones and some small ones, some positive ones and some negative ones. See if you can answer this question without looking ahead or in the *Reference Manual*: What is the biggest number than can be represented with an Integer variable?

While doing this, you may discover that including commas in numbers causes problems—which brings up an important point about numbers in computer programs: Commas inside of numbers are nothing but troublemakers. Leave them out.

As it turns out, Macintosh Pascal recognizes as an integer any number between -32,767 and 32,767 (without the commas). Any number smaller

than -32,767 or larger than 32,767 will be represented by another variable type.

If you got rebellious and tried to type a number such as 3.1416 into the variable entry with type Integer, you found it was impossible to do. The Mac simply beeps when the decimal point (or period, for us nonmath types) key is pressed. Numbers with decimal points don't fit into the Integer variable type.

All numbers fit into the variable type called Real numbers. The word *Real* is obscure in this context, but it is true that numbers in the real world *are* Real, for the most part. Money values (dollars and cents), food measures (half-gallons, quarts, 2.5-pound boxes of things), and interest rates (10.5%) are all examples of real-life Real numbers. Notice that they can all have decimal points or fractional parts.

Change the variable type in the test program to Real and then run the program again. Experiment with it a little. Can you come up with a number too big for it to handle (or too small, for that matter)?

It was probably difficult to find numbers the program wouldn't handle with the variable type Real. That's because the smallest number that Macintosh Pascal will allow in a variable of this type is the number 15 preceded by a decimal point and *46 zeros*! Now, *that's* a small number! And the largest number Mac Pascal can put into a Real variable is 34 followed by 39 zeros. That number's so big it can represent the national debt—with a lot of zeros left over!

SUMMARY

This chapter has introduced quite a bit of new information. We've examined the structure of a Pascal program and found, among other things, that it has

1. A specific place to declare variables
2. A strict rule about Begin-End pairs
3. Rules about how long names can be and what they can and cannot contain
4. A need for semicolons at the end of most program lines

You also learned about including comments in programs, using the principle that the computer ignores anything that appears between two curly brackets. You learned what variables are, why we have to declare them in Pascal, and how four different types of variables are declared and used in programs. ✚

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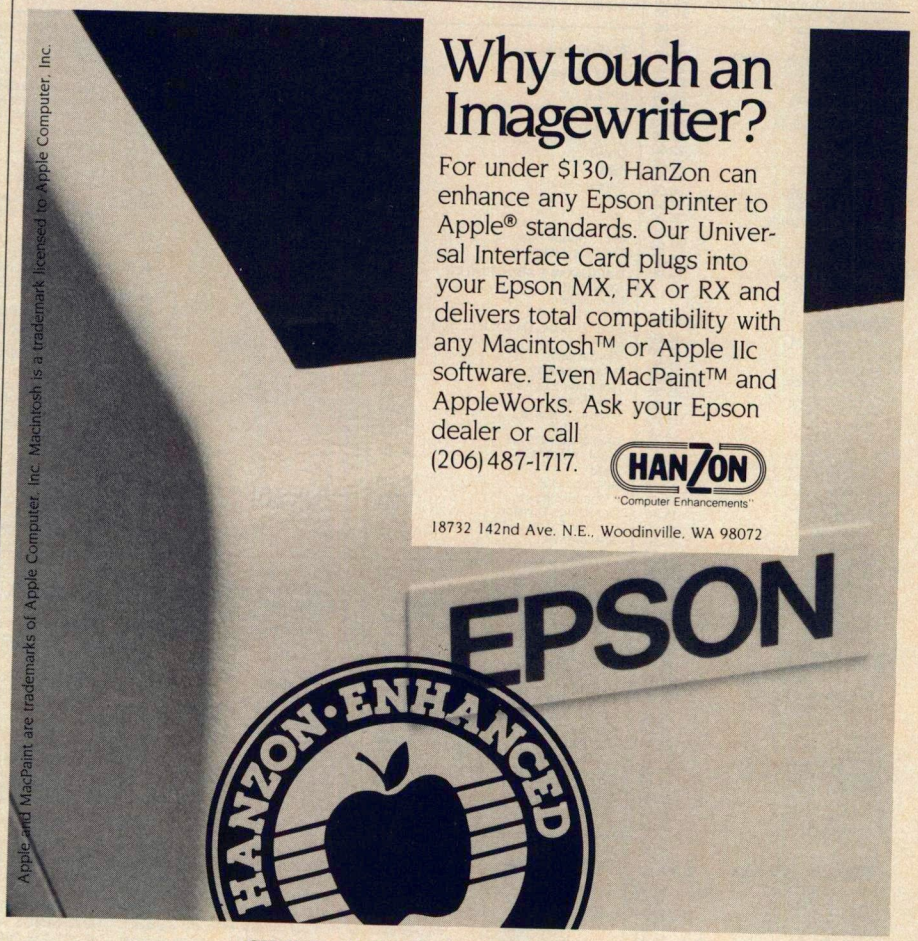

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CIRCLE 299 ON READER SERVICE CARD

MacTips

Suggestions from our readers

MACDEVELOPER TIPS

During several months of presenting MacTips, we have collected the following tips that assembly-language-software developers will find useful. If while developing software, you have discovered a tip or technique and would like to pass it along, please send it to A+. We will periodically present them in this column.

Modifier-Key Status

These procedures allow a programmer to check the status of a particular modifier key on the Macintosh keyboard. You may wish to use them if you want to "hide" a command or feature, or if you want to maintain continued selection in text editing—referred to as Shift-Click in the MacWrite manual (see figure 1, below).

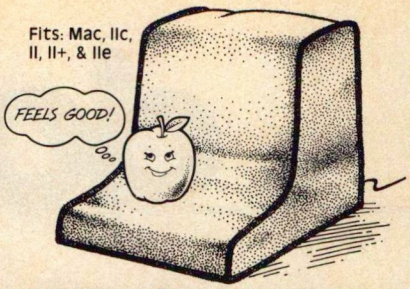
Michael Jablon
Peat, Marwick, Mitchell & Co.
New York, NY

Tips Gathered the Hard Way: Writing Fastfinder

1. In the PBSetVol call to the Mac operating system, if you supply a volume name, you must follow the name with a colon. This requirement is not documented. In some calls you don't have to follow the volume name with a colon, such as PBEject, where a colon is not allowed.
2. The PBDelete call to the Mac operating system will delete a locked file!
3. When the Apple Finder reports sizes such as 342K in disk or 100K in folder, those Ks are 1000s, not 1024s. Apple should have used a small *k* (342k in disk . . .).
4. For all desk accessories to work, an application must perform a call to TEInit. Again, this requirement is not documented anywhere.
5. The "Inited" bit in the file flags specifies that the file's icon has a place on the screen. Don't set this bit.

```
{------------------------------------------------------------------------}

VAR
   TheEvent : EventRecord;  { Your system global event record }

{------------------------------------------------------------------------}
{
The OptionDown function returns the current state of the Option Key:
   TRUE if the key is down, FALSE if it isn't.
The optionKey paramater is a system global.
}
FUNCTION   OptionDown  :  BOOLEAN;

BEGIN { OptionDown }

   OptionDown := ( ( TheEvent.Modifiers DIV optionKey ) MOD 2 ) = 1;

END;  { OptionDown }

{------------------------------------------------------------------------}
{
The ShiftDown function returns the current state of the Shift Key:
   TRUE if the key is down, FALSE if it isn't.
The ShiftKey paramater is a system global.
}
FUNCTION   ShiftDown  :  BOOLEAN;

BEGIN { ShiftDown }

   ShiftDown := ( ( TheEvent.Modifiers DIV ShiftKey ) MOD 2 ) = 1;

END;  { ShiftDown }
```

Figure 1: Use these procedures to check the status of a modifier key.



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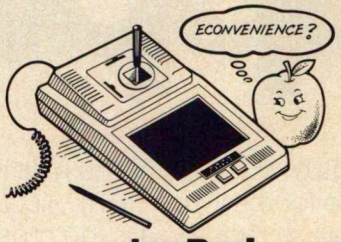

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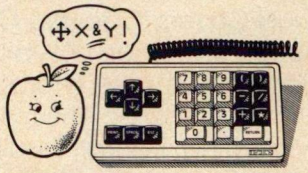

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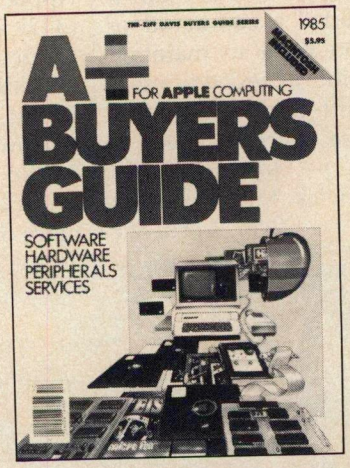

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6. When copying a file, if you want it to work the way Apple's Finder does, you must copy the file's creation and modification dates from the original directory entry and not allow the operating system to assign new dates to the copy, which it would do by default.
7. When you use the Launch Mac operating-system call, you will see a description of the file-information parameters. Your program must allocate them. You must allocate a handle and point the low-memory location to the parameters you set up. The volume-reference-number field of the parameters is also important. Some applications don't properly handle files with volume prefixes.

Mike Lehman
Tardis Software, Inc.
Pebble Beach, CA

Debugging Output

This code enables developers to output information for debugging purposes. The output is sent to the debugging terminal attached to the appropriate port. The attached terminal can be your Imagewriter printer.

```
{ --- GLOBAL DECLARATIONS --- }

CONST
   LF = CHR(10);

VAR
   P : TEXT;

{ --- INITIALIZATION --- }

      RESET(P,'.AOut');  { PORT A }
      RESET(P,'.BOut');  { PORT B }


{ --- ANYWHERE --- }

   WRITE(P,LF,output);

{ ------------------------------ }
```

Michael Jablon
Peat, Marwick, Mitchell & Co.
New York, NY

Parameter RAMS and Desktop Repairs

I am developing software for the Mac, using assembly language, and have uncovered these two tips that may be of interest:
1. The Mac has a battery-powered CMOS (low-power) IC device that

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Powertype Letter Quality (18 CPS)	499	379

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MacTips

has some memory called "parameter RAM." This RAM consists of 20 bytes and stores parameters when the machine is turned off. The parameters that are stored here are

a. Validity status
b. Modem-port configuration
c. Printer-port configuration
d. Alarm setting
e. Default application font
f. Auto-key threshold
g. Printer connection
h. Speaker volume
i. Double-click time
j. Caret-blink time
k. Mouse scaling
l. Preferred system start-up disk
m. Menu blink

In the midst of programming, I managed to clobber the printer-port configuration. I assumed that the parameters would be reinitialized if I turned the machine on and off. But no, you must unplug the Mac, remove the batteries, count to 10 (to appease the God of RAM latency), and then replace the batteries. On reboot, the Mac will discover that it has no parameters and supply the defaults. It took me a while to discover this one.

2. Inevitable problems occur in the Finder that can make your files unreadable or otherwise unusable (manifested by various I/O errors). The recovery technique requires the Resource Mover that Apple supplies to developers. Here's the procedure:

a. Using the Resource Mover, choose the Desktop Resource and cut everything out of it.

b. Close the Desktop file and the Resource Mover itself. (I have had it hang if I quit without closing.)

c. When the Finder discovers that its Desktop has been cleaned off, it graciously asks if it can reconstruct it. Say yes, and it will rebuild the Desktop, removing a lot of sins.

d. This procedure is also the way to get rid of unwanted file references and the like on the Desktop. If you don't have the Resource Mover, don't worry. Eventually someone who has the time will write a routine for this function. I plan to include something like this in my application.

Steve Rabalais
Rabalais Computing
Mesa, AZ

```
TYPE
   MyRecType = RECORD
                  A ,
                  B : INTEGER;
                   .
                   .
                  {Any data structure which is 256 bytes or less}
               END;

   OverlayType = RECORD
                    nextControl   : Handle;     {These fields are exact          }
                    contrlOwner   : WindowPtr;  {duplicates of the ControlHandle }
                    contrlRect    : Rect;       {data structure type.            }
                    contrlVis     : BOOLEAN;
                    contrlHilite  : BOOLEAN;
                    contrlValue   : INTEGER;
                    contrlMin     : INTEGER;
                    ContrlMax     : INTEGER;
                    contrlDefProc : Handle;
                    contrlData    : Handle;
                    contrlAction  : ProcPtr;
                    contrlrfCon   : LongInt;
                    theOverLay    : MyRecType;  {This is the location of the }
                                                {contrlTitle                 }
               END;

   OverlayPtr    = ^OverlayType;
   OverlayHandle = ^OverlayPtr;

VAR
   MyRec     : OverlayHandle;
   MyControl : ControlHandle;
   MyWind    : WindowPtr;
```

Figure 2: The ControlHandle data structure, showing location of the ContrlTitle structure

```
PROCEDURE Example;

VAR
   R : Rect;

BEGIN
   SetRect(R, {Applicable window dimensions}  );
   MyWind := NewWindow(  { Window manager parameters }  );

   SetRect(R, {Applicable Scroll Bar dimensions}  );
   MyControl := NewControl(  { Control manager parameters}  );

   MyRec := OverlayHandle(MyControl);   {This assigns the address of the
                                         controlHandle to MyRec          }

   {InOrder to access any fields in MyRec the statements are: }

   MyRec^^.OverLay.A := 1;
   MyRec^^.OverLay.B := 2;

   {Since MyRec is globally declared it can be accessed throughout the application.
    The only restriction is that the handle MyControl must be allocated.  }

END;
```

Figure 3: Overlaying your own data structure onto the ControlHandle structure

Optimizing Data-Structure Space

Macintosh applications can occupy a significant amount of memory. This suggestion explains a method of acquiring 256 bytes of memory whenever a window that contains a scroll bar is in existence.

Inside the scroll-bar data structure is a string of 255 characters reserved for the ContrlTitle, which is not used. You can use this space if you overlay the ControlHandle data structure with your own data structure.

See figure 2 (above) for the format of the required data structures.

In order to access this data structure, follow these steps:

1. Be certain that the program has made a call to the control-manager function GetNewControl or NewControl.
2. Overlay the ControlHandle with your data structure.
3. Access any applicable fields.
4. Be certain that the ControlHandle is not disposed of when your data structure is being used. The handle must not have its memory space taken away.

See figure 3 for an example of the execution of this code.

Abe Gole
Peat, Marwick, Mitchell & Co.
New York, NY

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Public Domain Software-$6/diskette
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MacTest-be sure your Mac works $39.
MacTerminal-terminal software $99.
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MacFan-Kit to keep your Mac cool $49.
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Laser Printer-300 Pixels / inch, stand-alone:$3300.; networked:$6800.
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MAC

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Requires: Macintosh

Warner Software, Inc.
666 Fifth Avenue
New York, NY 10103
(212) 484-3060

CIRCLE READER SERVICE NO. **293**

II SERIES

▸ HOMEWRITER 10 FOR THE IIc

This new 80-column printer connects with home computers via Epson's new plug-in printer-interface cartridges (PICs). Each PIC is a combined ROM cartridge and cable that connects the printer to a specific computer. The PICs plug in as easily as an electrical cord into an ordinary wall socket.

The HomeWriter 10 operates in both draft and near-letter-quality modes and offers all of the popular type styles. The printer operates at more than 1000 words per minute (200 cps) in draft mode and at more than 160 words per minute (16 cps) in near-letter-quality mode.

Lightweight and compact, HomeWriter 10 prints both bidirectionally and unidirectionally. It also features typewriter-style friction paper feed, a 1K buffer memory, and optional tractor and cut-sheet feeders. *(List Price: $269; PICs, $60 each; tractor feed, $39.95; cut-sheet feeder, $99.95)*

Requires: Apple IIc

Epson America
2780 Lomita Blvd.
Torrance, CA 90505
(213) 539-9140

CIRCLE READER SERVICE NO. **294**

II SERIES LISA MAC

▸ MOUSETRAC COMBO

MouseTrac Combo is a combination mouse and trackball that can be used with any mouse-compatible Apple computer. It functions as a trackball for editing, spreadsheet analysis, and filing, or as a mouse for plotting graphics and using pull-down menus. The MouseTrac Combo also features three function buttons for making menu and window selections. *(List Price: $125.95)*

Requires: Apple II, II Plus, IIe, IIc, Lisa, or Macintosh

Wico Corporation
6400 W. Gross Point Road
Niles, IL 60648
(312) 647-7500

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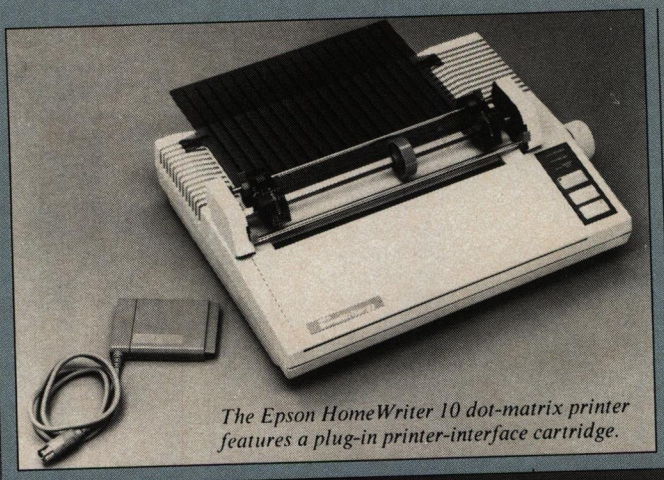
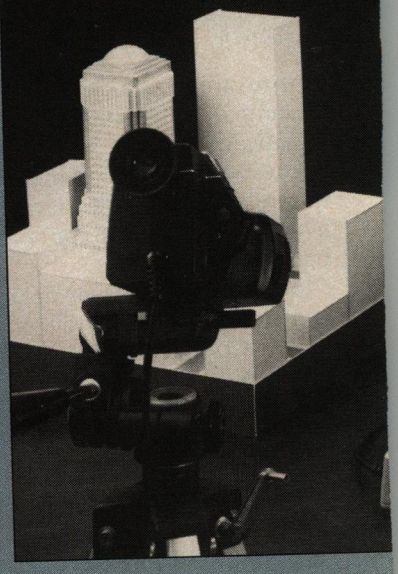


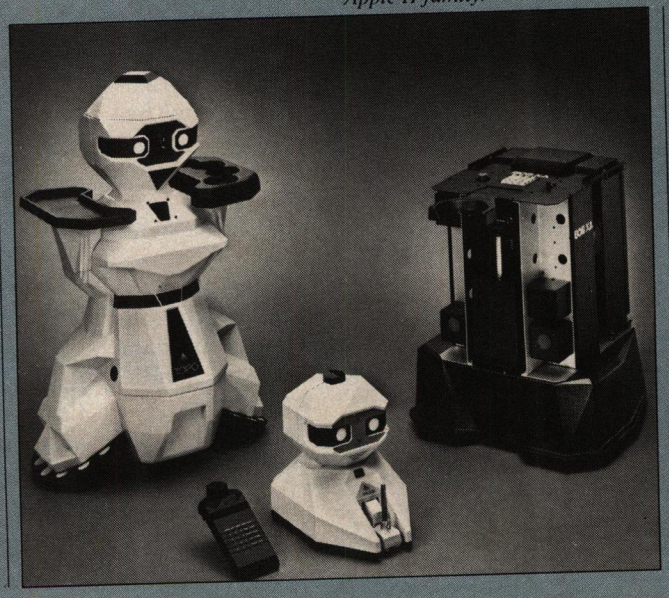
The Epson HomeWriter 10 dot-matrix printer features a plug-in printer-interface cartridge.

The MouseTrac Combo, from Wico Corporation, is a combination mouse and trackball that can be used with any mouse-compatible Apple computer.

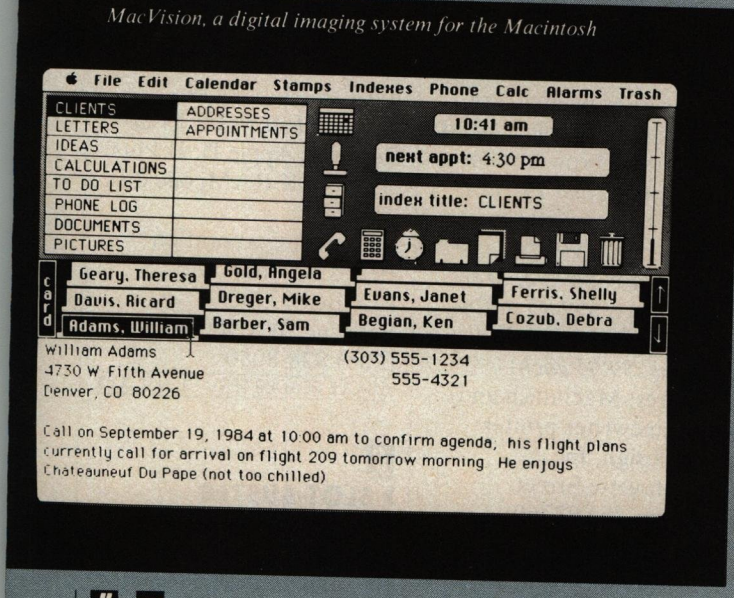
The Desk Organizer for the Macintosh, from Warner Software, Inc.



F.R.E.D., TOPO, and BOB/XA: three personal robots from Androbot, Inc. for use with the Apple II family.



MacVision, a digital imaging system for the Macintosh



II SERIES MAC

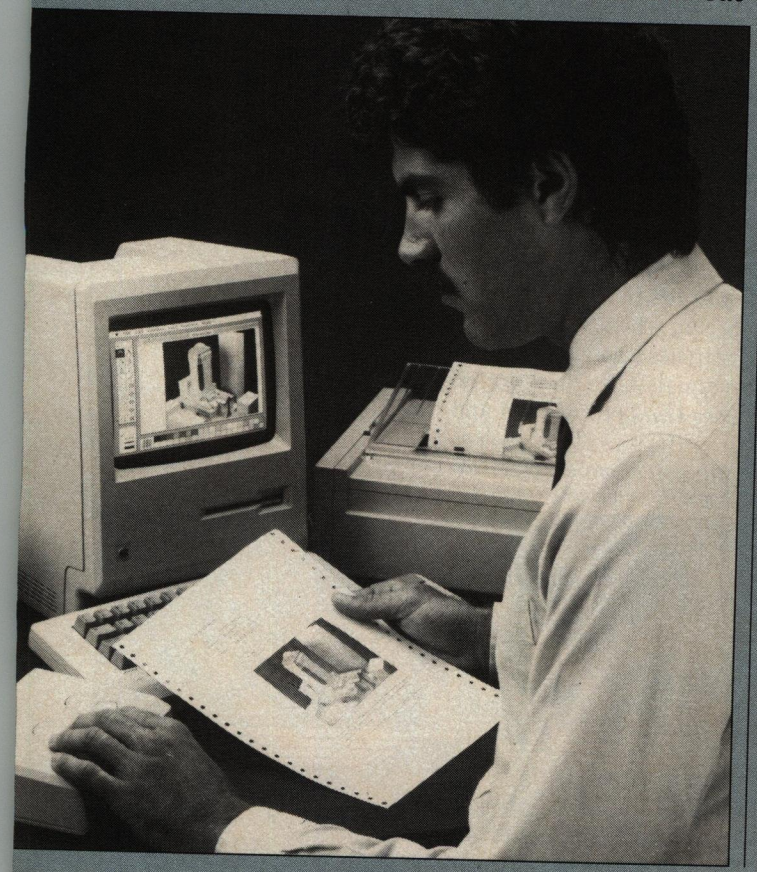
▸ ELECTRONIC NOVELS

Synapse Software has released the first two titles in a new series of Electronic Novels. Mindwheel takes users on a journey into the minds of four deceased people who had extraordinary power, and Essex is the story of an intergalactic search-and-rescue mission. The novels are packaged in hardbound-book form. The early chapters set the scenes for the story and introduce the relevant characters and information. Users then complete the story using a computer and the floppy disks that are included in the back of the book. The programs use a new interactive language that enables users to "talk" to characters and elicit replies that are "in character." *(List Price: $44.95 each)*

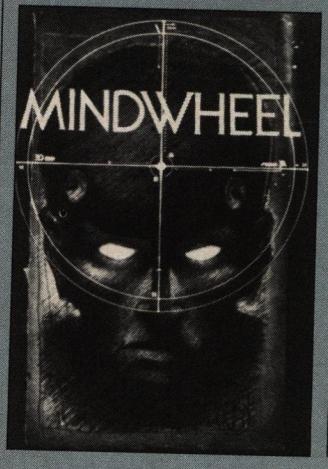
Requires: Apple IIe, IIc, or Macintosh

Synapse Software Corporation
5221 Central Avenue
Richmond, CA 94804
(415) 527-7751

CIRCLE READER SERVICE NO. **296**



Mindwheel, one of the first two titles in Synapse Software's new Electronic Novels Series



II SERIES

▸ F.R.E.D., TOPO, AND BOB/XA

The newest member of the Androbot family of personal robots, F.R.E.D. (Friendly Robotic Educational Device), has a 57-word vocabulary and drawing capabilities, and it can move in any direction. With the optional Logo Extension, F.R.E.D. can be programmed with an Apple II, II Plus, or IIe.

F.R.E.D.'s larger cousin TOPO is a three-foot-tall talking robot that can serve drinks or snacks from three trays provided by the new Androtray option. It can also be controlled by an Apple computer with the Logo Extension.

Androbot's most sophisticated robot, BOB/XA, includes infrared sensors, ultrasonic sensors, a fluxgate compass, navcode readers, and a lift arm, with full computing power on board. *(List Price: F.R.E.D., $499; Apple Logo Extension for F.R.E.D., $79; TOPO, $1595; Apple Logo Extension for TOPO, $99; BOB/XA, $7500)*

Requires: Apple II, II Plus, or IIe; Apple Logo; Apple Logo Extension

Androbot, Inc.
550 Charcot Avenue
San Jose, CA 95131
(408) 262-8676

CIRCLE READER SERVICE NO. **297**

MAC

▸ MACVISION

A digital imaging system for the Macintosh, MacVision digitizes a video image from any standard video source such as a video camera or VCR. MacPaint can enhance images that are captured with MacVision. Users can utilize other Macintosh software to add text, edit, and electronically transmit the digitized image. Any Macintosh-compatible dot-matrix printer can produce printouts, or the image can be stored on disk. *(List Price: $399)*

Requires: Macintosh

Koala Technologies Corporation
3100 Patrick Henry Drive
Santa Clara, CA 95052-8100
(408) 986-8866

CIRCLE READER SERVICE NO. **298**

HARDWARE

SAKATA SP-1000 DOT-MATRIX PRINTER

This 80-column, dot-matrix printer accommodates fanfold paper, single-sheet paper, and roll paper. It provides clearly formed characters with a 9×11 dot matrix at a speed of 100 characters per second or 5600 dots per second for

The Sakata SP-1000 Dot-Matrix Printer

graphics printing. Character spacing is fixed and proportional with line spaces of 1/6, 1/8, or 1/72 inch. The SP-1000 has adjustable tractor and friction feed and is equipped with a parallel Centronics interface. *(List Price: $369)*

Requires: Apple II, II Plus, or IIe; parallel interface

Sakata U.S.A. Corporation
651 Bonnie Lane
Elk Grove Village, IL 60007
(312) 593-3211

CIRCLE READER SERVICE NO. **310**

RITEMAN IIC DOT-MATRIX PRINTER

The Riteman IIc is a low-cost, dot-matrix printer with the interface and cable needed to hook up to your Apple IIc. It offers text printing at 120 characters per second (cps) with a 9 × 9 dot matrix. Equipped with both a parallel Centronics interface and a serial interface, the Riteman IIc features bidirectional printing, graphics printing, automatic underlining, boldface, superscript, and subscript capabilities. The Riteman IIc can fit inside a standard 3-inch briefcase and is covered by a one-year warranty. *(List Price: $399)*

Requires: Apple IIc or Macintosh

Inforunner Corporation
Airport Business Park
431 North Oak Street
Inglewood, CA 90302
(213) 453-6688

CIRCLE READER SERVICE NO. **311**

MACINTOSH PRODUCTS FROM I/O DESIGN

I/O Design has released several new products for the Macintosh. T-Shirt Factory is a four-color-transfer kit that enables you to create full-color, plain-paper, iron-on transfers using a Macintosh computer and an Imagewriter printer. The kit contains black, blue, red, and yellow, permanent-ink transfer ribbons.

Other products are the Macinware and Imageware carrying cases. The cases are made of dark blue Cordura nylon and have an interlining of brushed nylon in a Scottish plaid design. Macinware can hold an entire Macintosh system, including external disk drive, keyboard, mouse, disks, manuals, and cables. Imageware holds an 80-column Imagewriter and a supply of paper.

Mac-in-the-Box is a wooden desktop workstation for the Macintosh and its peripherals. The cabinet is available in finished (stained and varnished) and natural wood, and it can house a Macintosh, Imagewriter, external disk drive, modem, keyboard, mouse, and accessories.

Finally, color ribbons for Imagewriter printers are available in six colors—red, blue, green, brown, yellow, and purple. *(List Price: T-Shirt Factory, $59.95; Macinware, $99.95; Imageware, $69.95; Mac-in-the-Box, $99.95 unfinished, $129.95 finished; ribbons, $9.95 each)*

Requires: Macintosh and/or Imagewriter printer

I/O Design, Inc.
19 Lafayette Street
Rumson, NJ 07760
(201) 747-0943

CIRCLE READER SERVICE NO. **312**

SOFTCARD II

SoftCard II allows owners of Apple II computers to run most application programs written for the CP/M-80 operating system. SoftCard II includes Version 2.2 of the CP/M-80 operating system; a 6-MHz Z80 processor, which enables SoftCard II to execute applications up to three times faster than can the original SoftCard; 64K of on-board RAM; and Microsoft's BASIC Interpreter, which supports graphics applications. Four manuals—A *Quick Reference Guide* for CP/M and for Microsoft BASIC, a CP/M tutorial, and a *Programmer's Reference Manual*—accompany the system. *(List Price: $425)*

Requires: Apple II, II Plus, or IIe; 64K RAM; one disk drive

Microsoft Corporation
10700 Northup Way
P.O. Box 97200
Bellevue, WA 98009
(206) 828-8080

CIRCLE READER SERVICE NO. **313**

SLOT-BUSTER

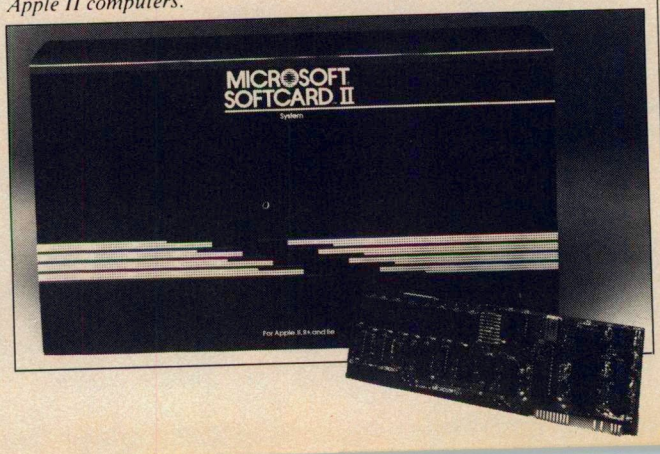
A plug-in peripheral card for Apple II computers, the Slot-Buster contains both a Centronics-type parallel and an RS-232C serial interface for printers, a speech synthesizer, and a buffer. Both printer ports can operate simultaneously on two different files, and the 8K buffer, which is expandable to 24K, operates with both printer ports and the synthesizer. The card is compatible with BASIC, CP/M, and Pascal 1.1 and with AppleWorks. *(List Price: $229.95)*

Requires: Apple II, II Plus, or IIe

RC Systems, Inc.
121 W. Winesap Road
Bothell, WA 98012
(206) 771-6883

CIRCLE READER SERVICE NO. **314**

Microsoft's SoftCard II replaces the company's original SoftCard for Apple II computers.



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SPECTRUM LX-80

Epson's new 80-column dot-matrix printer operates at 100 characters per second (cps) in draft mode and 16 cps in near-letter-quality mode and offers more than 160 type styles through Epson's SelecType feature. With SelecType, users can choose any combination of popular print styles—such as compressed, italic, elite, or doublestrike—simply by pressing buttons on the printer's control panel.

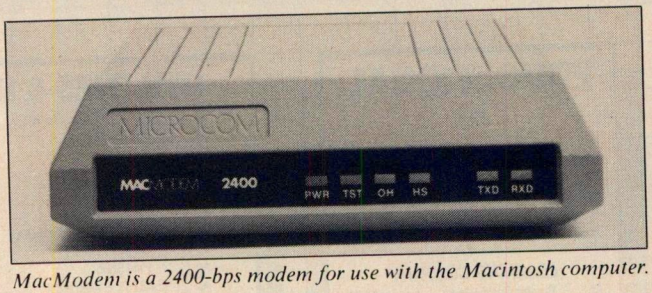
Users can also switch the Spectrum LX-80 from draft mode to near-letter-quality mode, either through SelecType, by resetting DIPswitches, or through programming the printer.

The Spectrum LX-80 features a built-in parallel interface, friction feed, and 1K of buffer memory. The Spectrum LX-80 prints both bidirectionally and unidirectionally. *(List Price: $349; tractor feeder, $39.95; cut-sheet feeder, $99.95; 32K buffer board, $175)*

Requires: Apple II, II Plus, IIe; or Macintosh with HandZon serial interface card.

Epson America
2780 Lomita Blvd.
Torrance, CA 90505
(213) 539-9140

CIRCLE READER SERVICE NO. **351**



MacModem is a 2400-bps modem for use with the Macintosh computer.

MACMODEM 2400

Microcom has introduced a 2400-bps version of its MacModem 1200 for the Macintosh. The MacModem 2400 provides users with a total communications system that includes a Hayes-compatible modem, cables, and communication software. The system incorporates the Microcom Networking Protocol (MNP), which corrects transmission errors caused by phone-line interference and noise, and it also supports VT-100, VT-52, and IBM 3101 terminal emulation and unsupported operation. *(List Price: $899)*

Requires: Macintosh

Microcom, Inc.
1400A Providence Highway
Norwood, MA 02062
(617) 762-9310

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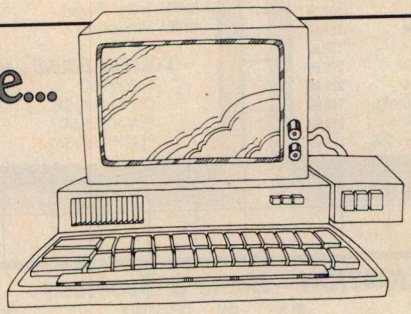

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RISING SPREADSHEET (A) KNOCKS MEXICAN JUMPING BEANS (B) INTO MOUTH OF NEUROTIC MAN (C) WHO IS SO DISCOMBOBULATED THAT HIS HAIR STANDS ON END, DISLODGING HAT (D) WHICH OPENS CAGE (E) AND RELEASES EPICUREAN MOUSE (F).

MOUSE, INSPIRED BY SCENT OF PERFECTLY AGED CAMEMBERT CHEESE, GNAWS THROUGH SPREADSHEET, ONLY TO DISCOVER HE HAS BEEN FOOLED BY AROMA OF OVER-RIPE GORGONZOLA (G).

IN A FIT OF PIQUE HE SPILLS VINTAGE WINE (H) INTO WATER-WHEEL (I) WHICH TURNS PULLEY THAT CAUSES GLOVE (J) TO GRASP SPREADSHEET AND MOVE IT TO TAPING AREA.

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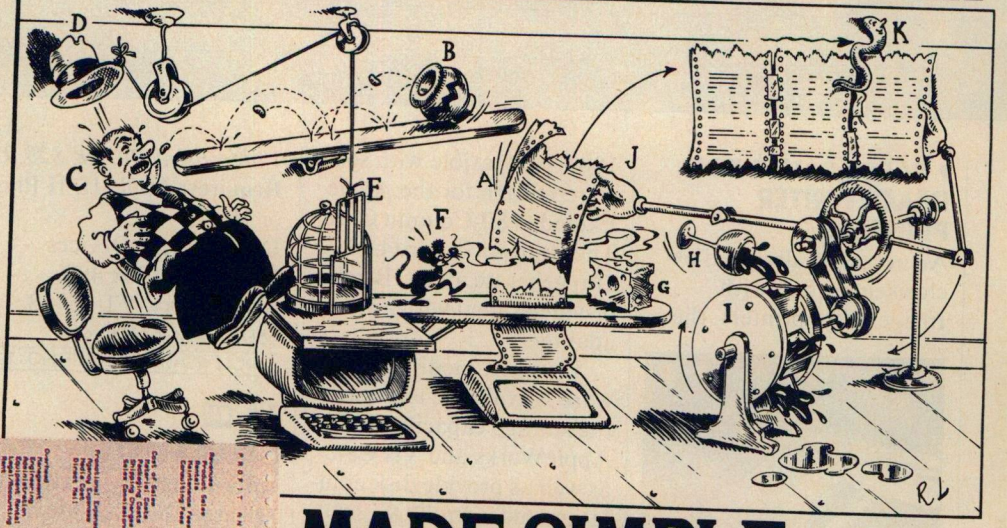

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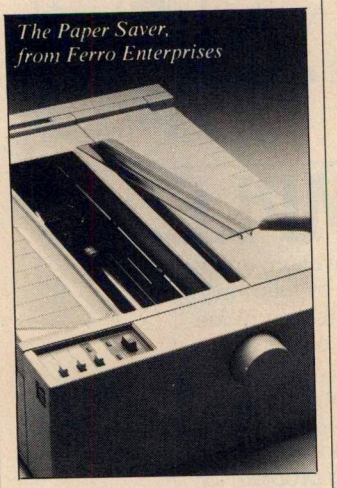
▸ PAPER SAVER FOR IMAGEWRITER PRINTERS

An accessory designed exclusively for use with Imagewriter printers, the



The Paper Saver, from Ferro Enterprises

Paper Saver fits neatly into the printer's single-sheet slot to prevent tractor-feed paper from curling into the slot and jamming. The device also eliminates the need to advance the paper past the single-sheet slot. Two versions of the Paper Saver are available—one for standard Imagewriters and one for wide-carriage printers. *(List Price: standard version, $6; wide-carriage version, $8)*
Requires: Imagewriter printer
Ferro Enterprises
P.O. Box 2151
La Jolla, CA 92038
(619) 456-2213
CIRCLE READER SERVICE NO. **315**

II SERIES

▸ RAMWORKS

Ramworks is a new 64K–1024K RAM card that plugs into the auxiliary slot in the Apple IIe. It provides 80-column text display and memory expansion up to 1024K in 64K or 256K increments. Ramworks is 100% compatible with software written for the Apple Extended 80-Column Card. The Ramworks card can also generate an RGB color-video signal with an adapter.

Low-cost modifier software is available to expand the storage capacity of AppleWorks and VisiCalc as well as provide disk emulation under ProDOS, DOS 3.3, Pascal, and CP/M. *(List Price: 64K, $179; 128K, $249; 256K, $449; 512K, $799; 1024K, $1499; RGB Adapter, $129)*
Requires: Apple IIe
Applied Engineering
P.O. Box 798
Carrollton, TX 75006
(214) 492-2027
CIRCLE READER SERVICE NO. **316**

II SERIES

▸ SPRITE & STEREO BOARD

Development Devices' new Sprite & Stereo Board adds arcadelike sound and graphics to an Apple II computer. The board includes more than 140 ROM-based utilities that you can call easily from any programming language by using Sprite Codes. The board's video, which offers three different graphics modes and one text mode, is based on the TMS9918 and supports 32 sprites and a high-resolution plane of 256 × 192 pixels. Each of two audio channels has one noise and three voice generators with programmable amplitudes and a power amplifier that can drive an 8-ohm speaker. Video Print Buffer software, which allows your computer to print as fast as it can run, is available separately. *(List Price: 16K RAM board, $249; 64K RAM board, $299; Video Print Buffer, $29.95)*
Requires: Apple II, II Plus, or IIe
Development Devices
RD 3/P.O. Box 490
Middlebury, VT 05753
(802) 388-6698
CIRCLE READER SERVICE NO. **317**

II SERIES MAC

▸ BLUE MAC

Inforunner Corporation has released the Blue Mac, a 9 × 9 dot-matrix printer that has built-in interfaces for both the Macintosh and the Apple IIc. The printer is also compatible with the Epson RX-80 FT and the MX-80 FT Graftrax Type III. Thus equipped with both parallel- and serial-interface capability, the printer can print at a rate of up to 140 characters per second and can fit in a standard 3-inch-deep briefcase. Other features of the Blue Mac include an easily replaceable cartridge ribbon and quick paper tear-off. The printer has both friction and pin feed and an option for an adjustable tractor feed. *(List Price: $549)*
Requires: Macintosh or IIc
Inforunner Corporation
Airport Business Park
431 North Oak Street
Inglewood, CA 90302
(213) 453-6688
CIRCLE READER SERVICE NO. **324**

II SERIES

▸ THE TTXPRESS PORTABLE PRINTER

The TTXpress measures 1¾ × 4½ × 11¼ inches and weighs only 2 pounds, making it light and small enough to fit in your briefcase. This thermal printer uses a 7 × 9 dot matrix to print graphics and clear text with true descenders, 80 columns wide on standard 8½ × 11-inch paper. It can also produce boldface and underline and has a Condensing feature that lets you print 160-column spreadsheets on a single page. TTXpress has an internal buffer and built-in Centronics-style parallel and 1200-baud, RS-232 serial interfaces to make it compatible with most lap-size and portable computers. *(List Price: $199)*
Requires: Apple IIc
TTX, Inc.
3420 East Third Avenue
Foster City, CA 94404
(800) 223-1711
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CIRCLE READER SERVICE NO. **325**

Blue Mac, a 9 × 9 dot-matrix printer for the Mac and the IIc

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MICROPROSE
F-15 Strike Eagle ... $23
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Nato Commander ... $23
Solo Flight ... $23
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Dollars & Sense ... $67
Dollars & Sense (IIc) ... $77
Dollars & Sense(MAC) $95
Forecast (II Series) ... $39
Forecast (MAC) ... $49
OMNITRENDS
Universe ... Call
ORIGIN
Ultima III ... $39
PRACTICORP
Practicalc II ... $43
PRECISION
Superbase ... $65
PROFESSIONAL SOFTWARE
Trivia Fever ... $25
Trivia Fever (MAC) ... $27
Super Sports Trivia Data Disk ... $21
RESTON
Movie Maker ... $35
SCARBOROUGH
Build A Book ... $27
Mastertype ... $25
Mastertype (MAC) ... $33
Make Millions (MAC) $33
Net Worth ... $49
Run for the Money (MAC) ... $33
SIERRA ON LINE
Dark Crystal ... $25
Homeword ... $43
Homeword w/Speller $67
Homeword Filer ... Call
King's Quest (128K) ... $33
Time Zone (6 disks) ... $67
Ultima II ... $39
Ultima II (MAC) ... Call
SPINNAKER
All Titles ... Call
SPRINGBOARD
Early Games ... $23
Easy as ABC ... $27
Newsroom ... $33
Stickers ... $23
SSI
Battle Normandy ... $25
Broadsides ... $25
Carrier Force ... $39
Computer Baseball ... $25
Computer QB ... $25
Eagles ... $25
50 Mission Crush ... $25
Gemstone Warrior ... $23
Germany 1985 ... $39
Imperium Galactum ... $25
Kampfgruppe ... $39
North Atlantic '86 ... $39
Objective Kursk ... $25
Operation Market Garden ... Call
Pro Tour Golf ... $25
Questron ... $33
Rails West ... $25
Reforger '88 ... $39
Ringside Seat ... $25
War In Russia ... $53
SUBLOGIC
Flight Simulator II ... $33
TIMEWORKS
Evelyn Wood Dynamic Reader ... $47
TRILLIUM
Amazon ... $25
Dragonworld ... $25
Fahrenheit 451 ... $25
Rendezvous w/Rama $25
Shadow Keep ... $25
*All Titles coming soon for the Macintosh
WINDHAM CLASSICS
Alice In Wonderland ... $21
Below the Root ... $21
Swiss Family Robinson ... $21
Wizard of Oz ... $21
ACCESSORIES
BASF SS. DD ... $14 Bx
BASF DS. DD ... $19 Bx
Compuserve Starter Kit (5 hrs.) ... $23
Compuserve Vidtex (Specify Model) ... $25
Disk Case (Holds 50) ... $9
Disk Drive Cleaner ... $9
Grappler + Int. ... Call
Rana Elite One ... $199
T.T.C. AA/AD 300 Baud Modem w/ASCII Express Call

P.O. BOX 278-DEPT AP-WILDWOOD, PA 15091

***Ordering and Terms:** Orders with cashier check or money order shipped immediately. Personal/company checks, allow 3 weeks clearance. No C.O.D.'s. **Shipping: Continental U.S.A.**—Orders under $100 add $3; **free shipping on orders over $100.** PA residents add 6% sales tax. **AK, HI, FPO-APO**—add $5 on all orders. **International Order Policy**—No Credit Cards—add $15 or 15% of order whichever is greatest. Defective merchandise will be replaced with same merchandise—NO CREDITS! Return must have authorization number (412) 361-5291. Prices subject to change without notice.

CIRCLE 155 ON READER SERVICE CARD

A+ pipeline

SAMSUNG CD 1451D COLOR MONITOR

Samsung has introduced a new 14-inch, high-resolution, color-display monitor that is compatible with the Apple IIe. The Model CD-1451D can display an infinite range of colors and up to 1000 characters. Other features include composite/TTL input signal, video- and audio-input jacks, and a built-in sound system. *(List Price: $299.95)*

Requires: Apple IIe

Samsung Electronics America, Inc.
117 Seaview Drive
Secaucus, NJ 07094
(800) 323-2181
in NJ (201) 867-7575

CIRCLE READER SERVICE NO. **354**

SPACE TABLET

A three-dimensional input device for Apple-II-series computers, Space Tablet consists of a receiver frame that users position on top of the video display and a pencil-like sonic pointer that they can hold up to six feet away. The receiver frame detects the position of the pointer in all three dimensions and reports that information to the software. The Space Tablet currently operates in two dimensions with most currently-available software and can take the place of a touch tablet or joystick as an input device. In addition, programmers can use the third-dimension information to develop new applications. *(List Price: $175)*

Requires: Apple II, II Plus, IIe, or IIc

Soniture, Inc.
2146 Paragon Drive
San Jose, CA 95131
(408) 435-0217

CIRCLE READER SERVICE NO. **355**

THE MICRO-IMAGER

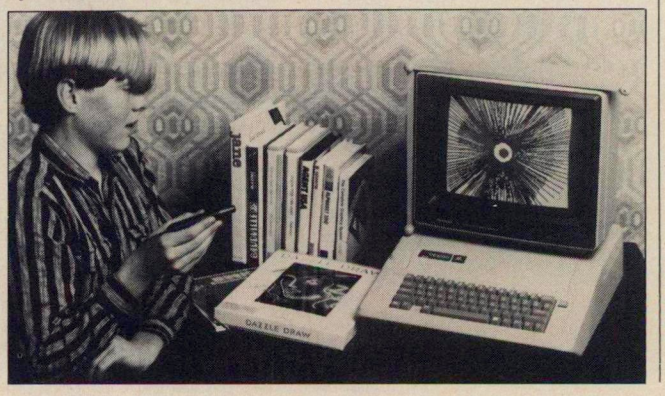
The Micro-Imager video digitizer lets you capture an image, either from a black-and-white or a color source, in your Macintosh computer. The source—which can be a camera, recorder, or laser-disc player, for example—must conform to the NTSC (EIA RS-170) synchronization standard. The Micro-Imager stores images as MacPaint files, and you can then edit, recall, or print them. *(List Price: $349.95)*

Requires: Macintosh

Servidyne Systems, Inc.
1735 DeFoor Place NW
P.O. Box 93846
Atlanta, GA 30377
(404) 352-2050

CIRCLE READER SERVICE NO. **357**

Space Tablet, from Soniture, Inc.

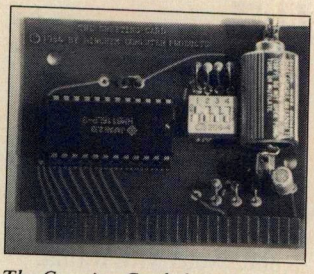


▶HARDWARE/ SOFTWARE

II SERIES

▶THE GREETING CARD

The Greeting Card is designed to deter the unauthorized use of your Apple II, II Plus, or IIe. By storing a security program in the card's 2K nonvolatile memory, only those who know a password can use the computer. You can also use The Greeting Card to leave a short message for other computer operators; in fact, it can store up to eight assembly-language programs, any of which may be set to run every time the Apple is turned on. Supplied with The Greeting Card is an extensive manual and a disk with the necessary programs for access security and leaving messages. *(List Price: $69.95)*



The Greeting Card, from Birchem Computer Products

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive.

Birchem Computer Products
5728 Thames Way
Carmichael, CA 95608
(916) 489-7542

CIRCLE READER SERVICE NO. **358**

MAC

▶MAC PRIVATE EYE

A professional video digitizer for the Macintosh, Mac Private Eye creates high-resolution, 512 × 512-pixel images from any NTSC (RS-170) video source such as a TV camera, TV monitor, or video cassette recorder. Mac Private Eye digitizes video frames fast enough to work with moving images—the Macintosh screen doubling as a video monitor for focusing. It also features a random-dot-pattern generator capable of creating images with continuous shades of gray.

Applications for Mac Private Eye include graphic arts, architecture, engineering drafting, building security, medical imaging, pattern recognition, advertising and publication layout, and video archiving. *(List Price: Mac Private Eye, $595; Mac Private Eye with a black-and-white TV camera, $799)*

The Mac Private Eye, from I/O Video, Inc.

Requires: Macintosh

I/O Video, Inc.
222 Third Street
Cambridge, MA 02142
(617) 547-4141

CIRCLE READER SERVICE NO. **359**

Filevision™

Turn your Macintosh™ into a visual filing system.

Words. Numbers. Pictures.
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With Filevision you have the power to:

- Put pictures and information together in a filing system
- Draw lines, rectangles, squares, ovals, circles, and free-form shapes
- Stretch, shrink, reshape, cut, paste, move and copy
- Overlap, hide and highlight
- Change and create symbols
- Print lists, labels and pictures
- Change print styles and sizes
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Filevision is a trademark of Telos Software Products. Macintosh is a trademark licensed to Apple Computer, Inc. Telos is a trademark of Telos Corporation

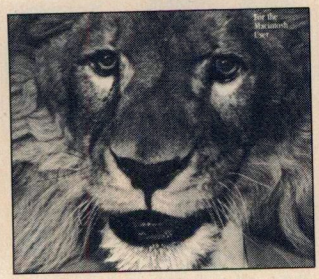
CIRCLE 301 ON READER SERVICE CARD

SOFTWARE

MAC

MACLION

A relational-database-management system for the Macintosh, MacLion also contains a Report Writer and a Screen Generator. These features let users define and see a preview of reports or screens by moving fields into position with a mouse. The screen generator also has multirelational capabilities for both entering data into and extracting data from a database. The system's use of the Mac's mouse and pull-down menus makes it easy to use, and applications developed under MacLion can also use the mouse, pull-down menus, dialog boxes, and programmable buttons. You can increase MacLion's performance if you use a 512K Mac and/or a hard-disk drive. *(List Price: $379)*



MacLion, from Computer Software Design

Requires: Macintosh, 128K RAM, two floppy-disk drives
Computer Software Design
1911 Wright Circle
Anaheim, CA 92806
(714) 634-9012
CIRCLE READER SERVICE NO. **326**

II SERIES

REMEMBER!

This learning tool for Apple-II-series computers facilitates learning of relationships, facts, sequences, and lists. It can be used to increase study effectiveness of virtually any subject.

Remember! includes three learning modes: Familiarization, Practice, and Test. Entering study material is easy with the on-screen prompts and built-in help. Students can further personalize the program by entering their own written, auditory, or pictorial hints to assist in learning the materials. Remember! also includes all the necessary special characters for studying French, Spanish, German, and Italian, as well as science and math. *(List Price: $79.95)*
Requires: Apple II, II Plus, IIe, or IIc; 64K RAM; one disk drive; optional joystick
DesignWare
185 Berry Street
San Francisco, CA 94107
(415) 546-1866
CIRCLE READER SERVICE NO. **327**

II SERIES

THE ORIGINAL BOSTON COMPUTER DIET

The Original Boston Computer Diet counselor analyzes users' nutritional requirements, monitors their eating and exercise habits, and suggests meal plans. To supplement use of the program, an extensive series of optional readings is included.

The program is designed for people with weight-loss problems of 10 to 40 pounds. *(List Price: $79.95)*
Requires: Apple II Plus, IIe, or IIc
Scarborough Systems, Inc.
55 S. Broadway
Tarryton, NY 10591
(914) 332-4545
CIRCLE READER SERVICE NO. **328**

II SERIES MAC

TELARIUM SCIENCE-FICTION SOFTWARE

A line of interactive science-fiction software based on the works of best-selling novelists, the Telarium line includes Fahrenheit 451, Rendezvous with Rama, Dragonworld, and Amazon.

Fahrenheit 451 takes the player into midtown Manhattan on a dangerous mission. As Guy Montag, the player is a member of the Underground in a society whose government is committed to controlling the populace by systematically destroying all literature.

In Rendezvous with Rama the player assumes the role of captain of a small spaceship that encounters a huge, alien starship. Your goal is to explore the starship Rama and make the first contact with an alien intelligence.

Dragonworld puts you in the role of Amsel of Fandora, a kindly hermit who learns that his old friend the Last Dragon has been kidnapped. As he attempts to rescue his friend, Amsel encounters thieves, monsters, beggars, and artists.

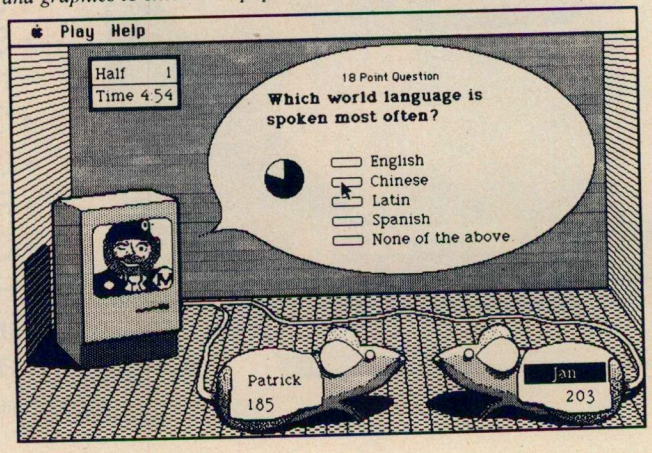
In Amazon you are an agent for NSRT, a high-tech firm. Your assignment is a solo expedition to the Amazon; the goal is to locate the Lost City of Chak and to recover emeralds. *(List Price: $39.95 each)*
Requires: Apple II, II Plus, IIe, IIc, or Macintosh; 48K RAM; one disk drive
Telarium Corporation
One Kendall Square
Cambridge, MA 02139
(617) 494-1200
CIRCLE READER SERVICE NO. **329**

MAC

MCTRIVIA

Using the sound and graphics of the Macintosh, McTrivia extends the popular board game. Sharing the mouse, two players or teams compete to answer more than 2000 questions. Questions cover a broad range of topics. Each team has a 15-second limit to click on one of five answers. Success brings bonus questions following three sequential right answers. One person may play alone for high-score records against the clock. *(List Price: $40)*
Requires: Macintosh
McCarron-Dial Systems
P.O. Box 45628
Dallas, TX 75245
(214) 247-5945
CIRCLE READER SERVICE NO. **331**

McTrivia, from McCarron-Dial Systems, Inc., uses Macintosh sounds and graphics to extend the popular board game.



SEE THE "TOTAL PICTURE" ON YOUR APPLE

Get the "total picture" for your spreadsheets with the Checkmate Technology MultiView 80/160 Card™.

The pictures shown are actual photos of 4 of MultiView's 7 screen sizes. The 132 and 160-column sizes display 12 full months of data PLUS totals to show you a "total picture" of your spreadsheet without scrolling! *And these sizes can be seen on any low-cost monitor (12MHz or better).*

Multi-View's 7 screen sizes are: 80×24, 80×32, 80×48, 96×24, 132×24, 132×30, and 160×24. MultiView's exclusive "wide angle" command can stretch all screen sizes making them easier to read.

The pictures shown use the underline attribute, one of MultiView's 12 standard attributes which include bold and inverse.

The ***Universal Spreadsheet PreBoot™,*** used to create the pictures shown, supports six spreadsheet programs including ***Visicalc, Multiplan,*** and ***Magicalc.*** *MultiView is the only card offering 160-columns with these programs.*

MultiView's usefulness doesn't stop with spreadsheets.

Popular word processors such as ***Wordstar, Apple Writer*** and ***Magic Window*** can use MultiView's larger sizes. For the first time, you can really see on screen what your printout will look like — no matter if you're printing in pica, elite, or condensed mode.

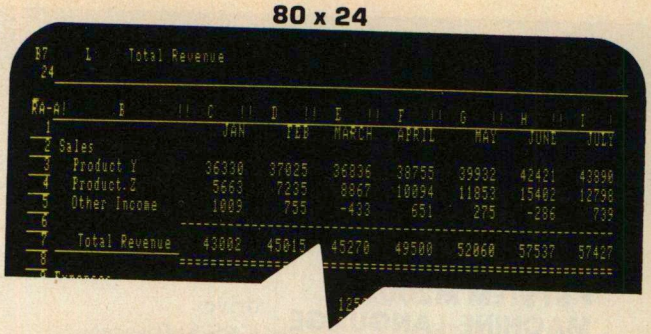
And ***AppleWorks*** can use MultiView's letter quality character set, attributes and wide angle screens.

Add one of these options and MultiView's flexibility increases: the **SuperWorks EPROM™** adds 20 function keys and a BASIC program line editor to your Apple; a **Language Factory Prom™** adds a second character set such as Spanish, German or math characters; and coming soon will be a high-resolution light pen. A 50 Hz international card version is also available.

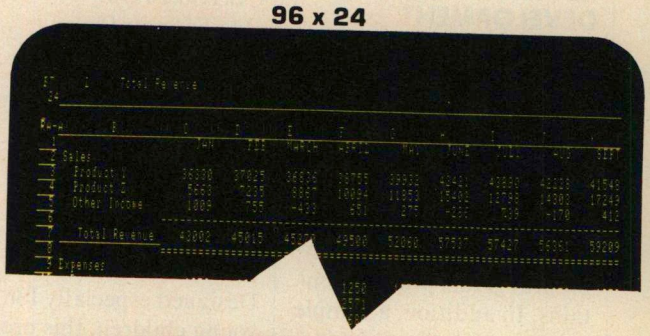
See your local computer dealer to get the "TOTAL PICTURE" for your Apple or call Checkmate Technology for the name of the dealer nearest you.

SUGGESTED RETAIL PRICE $349.95

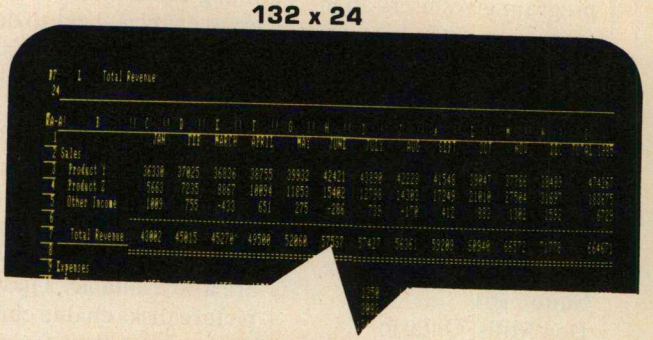
80 x 24



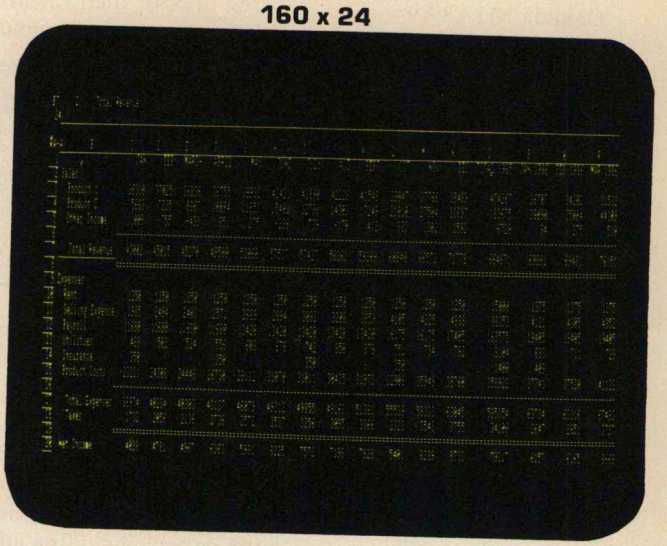
96 x 24



132 x 24



160 x 24



Other fine products for your Apple Computer:

IIe MaxiRam Card™ Adds 80-columns and an expandable 64K to 576K of memory to the IIe. Starts at $159.95 with 64K of RAM.
Zee80A Card Turns the Apple into a CP/M computer to run Wordstar, dBase II, etc. Software not provided. $89.95
IIe-80RAM Card Adds 64K of memory and 80-columns to the Apple IIe. $129.95

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509 South Rockford Drive • Tempe, Arizona 85281-3021
(602) 966-5802 U.S.A.
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Dealer Inquiries Invited

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Apple Writer and AppleWorks are trademarks of Apple Computer, Inc.
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Multiplan is the registered trademark of Microsoft Corporation.
VisiCalc is the trademark of Software Arts, Inc.
Wordstar is the trademark of MicroPro Corporation.

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CIRCLE 128 ON READER SERVICE CARD

II SERIES

SYSTEM M2000 MACHINE-LANGUAGE DEVELOPMENT SYSTEM

System M2000 consists of a powerful macro assembler, a full-featured text editor, a sophisticated machine-language monitor, as well as a copy program that allows users to back up the utility programs this product contains. In addition, a sample program gives users an introduction not only to machine language, but also to the capabilities of System M2000. *(List Price: $69.95)*
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive; DOS 3.3
Micol Systems
100 Graydon Hall Drive
Suite 2301
Don Mills, Ontario
Canada M3A3A9
(416) 441-3752
CIRCLE READER SERVICE NO. **332**

II SERIES

DR. SEUSS FIX-UP THE MIX-UP PUZZLER

For children ages 4 to 10, this electronic jigsaw puzzle features six favorite Dr. Seuss storybook characters, including The Cat in the Hat.

Each puzzle allows for dozens of different combinations, with five skill levels to choose from. In level 1, children can mix and match heads, bodies, and feet. In more advanced skill levels, puzzles are divided into smaller pieces that are scrambled by the computer. As children reassemble the puzzle, they can compete against a built-in timer. When the puzzle is completed correctly, the Dr. Seuss characters come to life through on-screen animation. *(List Price: $29.95)*
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive
CBS Software
One Fawcett Place
Greenwich, CT 06836
(203) 622-2500
CIRCLE READER SERVICE NO. **333**

II SERIES

COLORME: THE COMPUTER COLORING KIT

Designed especially for young children, this program enables them to design their own pictures, coloring books, and stickers on the computer screen and then print them out.

Special ColorMe Picture Disks featuring the Rainbow Brite, Hug-A-Bunch, and Shirt Tales characters are also available. These picture disks enable children to color their favorite characters on the computer screen and then print out the actual drawing.

ColorMe lets children use the computer to create color pictures and then print them out.

A ColorMe Supply Box includes an assortment of buttons and colored printing papers, including adhesive-backed paper for making stickers. *(List Price: $29.95; Picture Disks and Supply Box, $9.95 each)*
Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive
Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667
CIRCLE READER SERVICE NO. **334**

II SERIES

FISHER-PRICE LEARNING SOFTWARE

Four new educational programs for Apple-II-series computers—Alpha Build, Up & Add 'Em, Logic Levels, and Sea Speller—are now available from Fisher-Price Learning Software.

Alpha Build helps children ages 4 to 8 to develop letter- and word-recognition skills through eight different levels of difficulty. Up & Add 'Em helps children from 4 to 7 learn basic counting, addition, and subtraction. Logic Levels encourages logical thinking and helps children from 7 to 12 learn to predict the outcome of a series of actions. Sea Speller helps children from 7 to 12 develop word-recognition and spelling skills. *(List Price: $21.95 each)*
Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive; joystick
Fisher-Price Learning Software
P.O. Box 1327
Cambridge, MA 02238
(617) 494-1222
CIRCLE READER SERVICE NO. **335**

II SERIES

SOFTERM 1 AND 2

The communications programs Softerm 1 and 2 are now available in versions that can run on Apple IIe and IIc computers. Softerm 1 provides basic TTY terminal emulation and enables users to access information services and bulletin boards. Softerm 2 has all the features of Softerm 1 and also provides exact emulations of 24 of the most popular CRT terminals used for accessing company mainframes. Other features of the software include keyboard macros, a built-in phone book for automatic dialing, and extensive file-transfer capabilities. *(List Price: Softerm 1, $135; Softerm 2, $195)*

Softerm 1 and 2 are now available for the Apple II and IIc.

Requires: Apple IIe or IIc, 128K RAM
Softronics, Inc.
3639 New Getwell Road
Suite 10
Memphis, TN 38118
(901) 683-6850
CIRCLE READER SERVICE NO. **336**

II SERIES

MANY WAYS TO SAY I LOVE YOU

Intended for ages 4 and up, this computerized design tool allows children to create their own electronic greeting cards. Picture-driven activity menus make the program easy and fun to use. The program features a selection of colorful greeting-card backgrounds and borders, dozens of "stickers" (animated graphics), and electronic crayons for creating original designs. *(List Price: $29.95)*
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive
CBS Software
One Fawcett Place
Greenwich, CT 06836
(203) 622-2500
CIRCLE READER SERVICE NO. **337**

What made over 100,000 Apple II owners fall in love with System Saver?

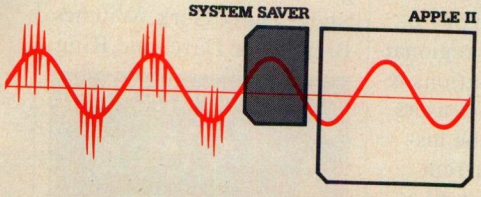
It's the most versatile, most convenient, most useful peripheral ever made for the Apple.®

System Saver® filters out damaging AC line noise and power surges.

70-90% of all microcomputer malfunctions can be traced to power line problems.* Problems your System Saver guards against.

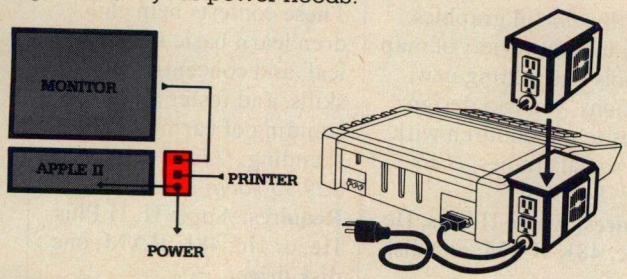
Power line noise can often be interpreted as data. This confuses your computer and produces system errors. Power surges and spikes can cause severe damage to your Apple's delicate circuitry and lead to costly servicing.

System Saver clips surges and spikes at a 130 Volts RMS/175 Volts dc level. A PI type filter attenuates common and transverse mode noise by a minimum of 30 dB from 600 kHz to 20 mHz with a maximum attenuation of 50 dB. You end up with an Apple that's more accurate, more efficient and more reliable.



System Saver makes your Apple more convenient to use.

No more reaching around to the back of your Apple to turn it on. No more fumbling for outlets and cords to plug in your monitor and printer. System Saver organizes all your power needs.

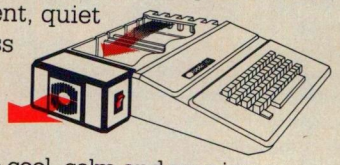


It functions as a multi-outlet power strip with two switched outlets. Plus System Saver offers the ultimate convenience; a front mounted power switch for fingertip control of your entire system.

System Saver lets your Apple keep its cool.

Today's advanced peripheral cards generate heat. In addition, the cards block any natural air flow through the Apple IIe creating high temperature conditions that shorten the life of the Apple and peripheral cards.

System Saver's efficient, quiet fan draws fresh air across the mother board, over the power supply and out the side ventilation slots. It leaves your Apple cool, calm and running at top speed.



So if you want to keep damaging heat, line noise and power surges out of your system for good, pick up the only peripheral that's in use every second your computer is in use. The System Saver. You'll soon come to think of it as the piece Apple forgot.

Compatible with Apple stand

$89.95 at Apple dealers everywhere.

KENSINGTON MICROWARE

CIRCLE 134 ON READER SERVICE CARD

251 Park Avenue South, New York, NY 10010
(212) 475-5200 Telex: 467383 KML NY

*PC Magazine: March 1983.

System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Available in 220/240 Volts, 50/60 Hz.

System Saver is a registered trademark of Kensington Microware Ltd.
© 1984 Kensington Microware Ltd. System Saver is patent pending.

INCREDIBLY SPREADABLE.

Do spreadsheets faster and easier with complete cursor control on the programmable IIe Tender Keypad.

The Apple IIe* is a nice computer. Until you try to do a ledger, a VisiCalc** spreadsheet...or for that matter, any program that uses numbers. It could take days.

Cursors!

What you need is the IIe Tender. It's the Apple* keypad that gives you cursor control in all directions, as well as four programmable keys which can be permanently defined to any frequently-used key. And redefined at will.

At your fingertips.

You also get the four mathematical functions, a decimal point, comma, space bar and delete key. Plus, the IIe Tender is human engineered to provide you with a sure touch and less user fatigue, and comes standard with Coupler-Calc software to turn it into a fixed or floating-point calculator. It's even color-coordinated to match your Apple.

You can install the IIe Tender–without taking up an expansion slot–in about five minutes. And our interface allows disconnection in seconds without getting inside.

Try one.

Try the incredibly spreadable IIe Tender at your local Apple Dealer today. Or write or call us for more information.

TRACK HOUSE

Track House is a division of Grimes Co.

GRIMES

115 S. Arovista Circle
Brea, CA 92621
Telephone:
(714) 671-3931

Dealer inquiries invited.

Standard, non-programmable models are also available for both the Apple IIe and Apple II+. Ask your dealer for details.*

**Apple IIe, Apple and Apple II+ are registered trademarks of Apple Computers, Inc.*
***VisiCalc is a registered trademark of VisiCorp.*

CIRCLE 255 ON READER SERVICE CARD

A+ pipeline

SERIES ▸ SMART SHOPPER

You can use Smart Shopper to create and print your shopping lists. The program helps you by maintaining up to five master lists that contain all the items you might possibly need. You tell Smart Shopper which items from the master lists you want included. Once you have made your selections, the program automatically prints your shopping list. *(List Price: $34.95)*

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive; printer

Software Publishing Corporation
1901 Landings Drive
Mountain View, CA 94043
(800) 523-6982

CIRCLE READER SERVICE NO. **362**

SERIES ▸ EUROPEAN NATIONS & LOCATIONS

On a complete map of Europe, or one of four regional maps, European Nations & Locations challenges users with questions on the historical facts and current European trivia, as well as on locations of major mountain ranges, rivers, lakes, countries, and capitals in Europe. Bonus points encourage faster answers, and correct answers are rewarded with colorful graphics.

By using a variety of map symbols and adding new questions, you can design games to aid children with their social studies. *(List Price: $44.95)*

Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive

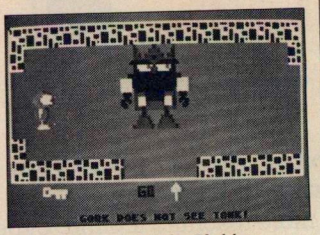
DesignWare
185 Berry Street
San Francisco, CA 94107
(415) 546-1866

CIRCLE READER SERVICE NO. **363**

SERIES ▸ CASTLE CLOBBER AND SUBTRACTION FAIR

These two educational-software programs from Mindscape are designed for children ages 4 to 8. Castle Clobber helps children build logic, inference, critical thinking, concentration, memory, and visual-discrimination skills as it challenges them to help Tonk rescue all the toys in Tink-!Tonk! land from the evil clutches of Gork. Five educational games are built into this graphic adventure, which offers multiple difficulty levels to match or challenge a child's skill.

Subtraction Fair invites children to a mathematical fair where they encounter games, prizes, adventures, and arcades. Children can pilot Tink into five different game booths—Magic Show, Dunk Gork, Witches Brew, Bear Dare, and Ring



Mindscape's Castle Clobber

the Bell—where they can play subtraction contests. These contests help children learn basic mathematical and concentration skills, and foster an understanding of earning and spending. *(List Price: $29.95 each)*

Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive

Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667

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II SERIES

TALES OF DISCOVERY

Pirates of the Soft Seas and Fossils Alive! are two new titles in Scholastic's language-arts series Tales of Discovery. The programs use an interactive-fiction approach to encourage children ages 8 and up to read. Children can control the stories by choosing such plot options as danger, humor, chance, and excitement. In Pirates of the Soft Seas, children try to outwit a band of pirates and solve a series of vocabulary and math puzzles to find buried chests containing pirated software. In Fossils Alive!, they search for fossils with a friend, Dyna Saurus, and learn how their neighborhood looked in prehistoric times. *(List Price: $24.95 each)*

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive

Scholastic, Inc.
730 Broadway
New York, NY 10003
(212) 505-3497

CIRCLE READER SERVICE NO. **365**

II SERIES

THE HALLEY PROJECT

This new software program is a real-time simulation of our solar system. The program seeks players who qualify for the top-secret Halley Project by completing a series of navigational tests in an authentic space simulation.

Through the tests and obstacles, The Halley Project helps players master basic facts about the solar system, including details on Halley's Comet and its orbit and an understanding of gravity; atmospheric conditions; orbital motion; relative size, position, and orbits of planets and moons; location of constellations; and how eclipses work.

The Halley Project introduces real-time space adventure.

A multitude of courses, subjected to random conditions, are built into the program to provide a variety of missions for the players. The program records players' progress and speed, encouraging them to undertake missions that will increase their understanding of the solar system.

Every planet, star, and moon depicted in the program moves at the same rate and in the same orbit or pattern as it actually does in our solar system. *(List Price: $44.95)*

Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive

Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667

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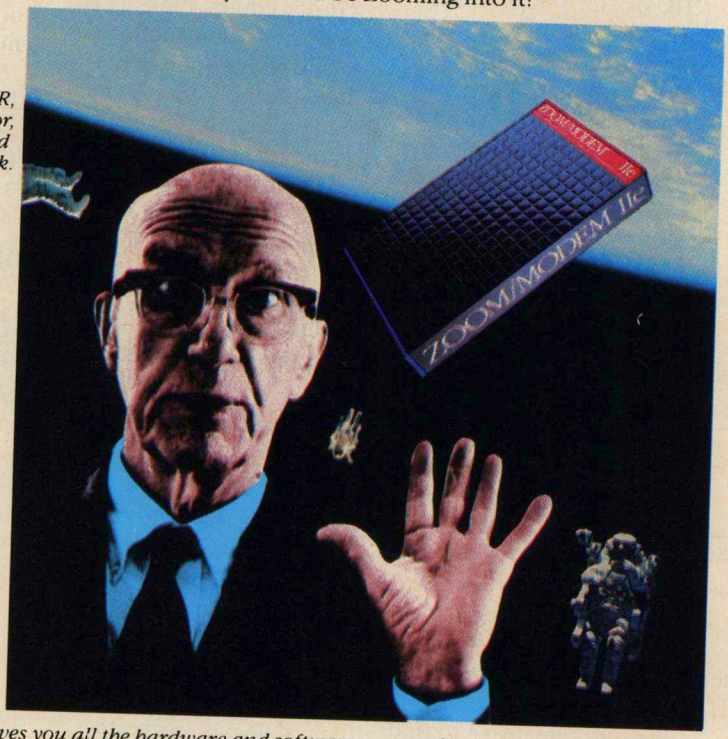
ZOOM

When Bucky Fuller talked about doing more with less, he didn't mean less information. ■ Quite the contrary: he thought there was far too much guessing going on, and precious little finding out. His idea was to find out everything possible about a subject, every fact from every conceivable point of view, and then make sense out of it. ■ He abhorred the time-honored practice of making decisions with half baked information. Bucky saw this clearly: if you have the wrong information . . . you will solve the wrong problem. Or you will create a new problem. Or you will blow the whole thing. The trick is to have the information. ■ More not less. ■ That's what the computer age is all about—fast abundant information. ■ Most of us just keep using computers as turbo typewriters or calculators, though, and never think once about information power. ■ Only 20% of the people with Apples even have modems. (It's enough to make Bucky stir in his grave.) ■ Computers talk very fast to other computers. They talk on the phone through modems. Most of the important and/or rare information in the world is in a computer somewhere, and you can reach it from your desk. ■ The question is: why do you sit there missing it . . . when you could be Zooming into it?

R. BUCKMINSTER FULLER,
Architect, Inventor,
Author, Educator and
Early Data Freak.



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CIRCLE 194 ON READER SERVICE CARD

HEAD

ZOOM/MODEM IIe ☐ For the Apple II, II+ and IIe Computers

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THE BODY TRANSPARENT

With The Body Transparent, players learn the names and locations of the body's organs and bones, as well as important facts about them. Players move the bones and organs to their correct locations, gaining bonus points for faster answers.

Facts and functions are provided for different parts of the body, and players must match those details to the correct part of the body. Correct answers are shown and rewarded, but incorrectly answered questions are recycled into the game to ensure that children learn the material. *(List Price: $44.95)*

Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive

DesignWare
185 Berry Street
San Francisco, CA 94107
(415) 546-1866

CIRCLE READER SERVICE NO. **367**

BETTER WORKING

A new line of adult productivity software for Apple-II-series computers, Better Working includes a spreadsheet program, a word-processing program, and a file-and-report program.

The Better Working Spreadsheet combines a full-featured spreadsheet with the sorting and searching capabilities of a database. It can be used to plan family budgets, prepare financial statements, and manage investments.

The second product in the line—the Better Working Word Processor—can be used to write, edit, store, and print documents.

The Better Working File & Report program is designed to store, update, organize, and print information. It can be used to create address files, recipe files, or household-inventory files. *(List Price: Better Working Spreadsheet, $59.95; Better Working Word Processor, $59.95; Better Working File & Report, $59.95)*

Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive

Spinnaker Software
One Kendall Square
Cambridge, MA 02139
(617) 494-1200

CIRCLE READER SERVICE NO. **368**

ALTERNATE REALITY

Datasoft has acquired a license to publish Paradise Programming's fantasy role-playing game Alternate Reality, in which an alien spacecraft abducts players and transports them to another time and place. In The City, the first episode in a series of seven, players must learn basic survival skills—they must earn money, eat, sleep, and learn to avoid dangers. As players' knowledge increases, they learn to find their way around the city and discover secret passages. Other life forms act as teachers if players measure up to their standards—traits such as patience, compassion, and honesty are valued more higly than strength and proficiency with weapons. *(List Price: $49.95)*

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive; joystick

Datasoft, Inc.
19808 Nordhoff Place
Chatsworth, CA 91311
(818) 701-5161

CIRCLE READER SERVICE NO. **369**

MINER 2049ER II

Micro Fun, the entertainment division of MicroLab, has released Miner 2049er II, a sequel to the arcade-style game Miner 2049er. In the game, players help Bounty Bob dodge ricocheting lumps of ore, time-warp transporters, and radioactive stalactites as he explores a radioactive mine. Girder cranes, high-speed conveyor belts, and hyperspace pads also help the hero escape from his enemy Yukon Yohan. The new game features ten screens, each with two levels of difficulty. *(List Price: $40)*

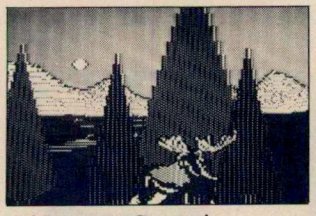
Requires: Apple II, II Plus, or IIe; 48K RAM; joystick

MicroLab, Inc.
2699 Skokie Valley Road
Highland Park, IL 60035
(312) 433-7550

CIRCLE READER SERVICE NO. **370**

WILDERNESS: A SURVIVAL ADVENTURE

Wilderness uses state-of-the-art graphics and accurate, detailed models of the environment and human physiology to recreate a true-to-life wilderness survival experience. This simulation contains two adventure scenarios. In the first, the player is the sole survivor of an airplane downed in the Sierra Nevada mountain range and must trek through the unknown to safety. The second scenario casts the player as an archaeologist seeking a lost city of gold.



Wilderness: A Survival Adventure

Players can explore the Sierra Nevadas—the topography that comes with the program—or venture beyond U.S. borders with supplementary disks for Bolivia, Burma, British Columbia, Chile, and New Guinea. Adventures in all six regions include ten levels of difficulty and an infinite number of topographies. *(List Price: $49.95)*

Requires: Apple II Plus, IIe, or IIc; 48K RAM

Peachtree Software
3445 Peachtree Road, N.E.
Atlanta, GA 30326-1276
(404) 239-3000

CIRCLE READER SERVICE NO. **372**

BUILD A BOOK ABOUT YOU

With a few keystrokes, users can create a personalized adventure storybook incorporating the name, address, pet, school, and friends of a special child. The program comes with everything necessary to print and bind two storybooks: two colorful illustrated page sets (32 pages each), two durable oversized hard covers, binding materials, and a software disk with several stories. Among the titles available are: The Mystery of Scented Mountain, The Holiday Dragon, Adventures on Riddle Planet, and The Greatest Circus Story Ever Told. *(List Price: $39.95; refill kits, $19.95 each)*

Requires: Apple II Plus, IIe, or IIc

Scarborough Systems, Inc.
55 S. Broadway
Tarryton, NY 10591
(914) 332-4545

CIRCLE READER SERVICE NO. **373**

▸ EARLY LEARNING SERIES

Volumes 1 and 2 of the 18-volume Early Learning Series are now available. The series is designed to enhance existing school curricula for preschool and kindergarten children, by exercising such skills as creativity and imagination; comprehension; hand-eye coordination; the use of descriptive language and visual and auditory memory; pattern, color, and shape recognition; and the ability to follow instructions. Each volume is a complete ready-to-use package and contains a manual, program disk, overlay, and self-contained easel. *(List Price: $99.95 each)*

Requires: Apple II, II Plus, or IIe; 48K RAM; Applesoft; one disk drive

Educational Computer Systems Corporation
10818 N.E. Coxley Drive
Suite E
Vancouver, WA 98662
(206) 256-4999

CIRCLE READER SERVICE NO. **374**

▸ LEARNING TOOLS FROM MILLIKEN

Adventure Alpha (ages 11 and up) and The Islands of Beta (ages 12 and up) teach problem solving, logic, and creative thinking. In these adventure games, players must solve mathematical problems and problems in logic in order to survive and find the hidden items necessary to complete each adventure.

Players of the Great Number Chase learn basic facts and operations, visual perception, and problem solving. Players direct a firefly through a mathematical maze, touching the correct combination of operations and numbers to reach a goal number. A Maze Factory offers players the option of creating their own mazes.

FourWord is a spelling game that teaches letter patterns and spelling. Four puzzles appear, each containing four words made up of four hidden letters. Players must solve all four puzzles before getting three strikes or misses.

WordLift teaches alphabetizing. In a building with ten floors, nine floors are occupied by words. By operating the elevator, players maneuver the words from floor to floor to place them in alphabetical order.

Word Machine is a spelling game in which words are shown and then quickly disappear. Players must then reassemble the words from a conveyor belt that passes under the machine's powerful vacuum tube. Both the level of difficulty and the speed of the conveyor belt automatically progress as the score increases.

Milliken's Math Sequences is a drill-and-practice series. Milliken has reprogrammed six of the mathematical operations (one per disk)—addition, subtraction, multiplication, division, fractions, and percents—and made them more appropriate for home use. *(List Price: $34.95 each; Six Math Sequences, $34.95 each)*

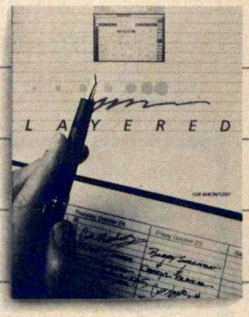
Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive

Milliken Publishing Company
1100 Research Blvd.
St. Louis, MO 63132
(314) 991-4220

CIRCLE READER SERVICE NO. **377**

Now there's a better way for health clubs to sort their courts.

NOW THERE'S FRONT DESK™



It will schedule time use of your facilities, your equipment, and your staff faster than an overhead slam. Then give you a picture of how profitably that time was used. Just push a button to see how much money you're making per court. Or per sport.

LAYERED
JOBWARE FOR MACINTOSH.

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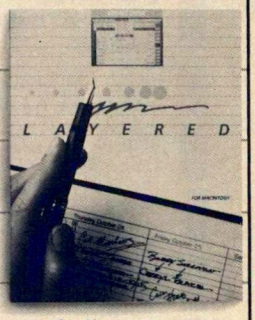
Now there's a better way for contractors to keep their backhoes from getting backlogged.

NOW THERE'S FRONT DESK™



Front Desk will keep schedules for all your equipment. Or your workers. Where they need to be. What they're supposed to do. And what they cost per hour. Then it creates reports showing how many hours are spent—and how many dollars are made—on each type of work. It can help you build a better business.

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WRITE YOUR OWN APPLE GAMES

Includes 40 exciting pre-programmed games to get you started!

Write Your Own Apple Games is your ticket to thousands of hours of solid game fun.

But it's more than just a game book.

While you're enjoying more than 40 exciting new programs, you'll be learning—quickly and easily—the most advanced techniques of computer game design.

In ***Write Your Own Apple Games,*** Stuart Anstis explains each game to you in logical, step-by-step subroutines. You'll see crucial game graphics exactly as they should appear on your screen.

Then you'll learn how to rearrange the basic subroutines to create countless game variations.

If you know BASIC, you're ready to learn state-of-the-art game techniques, including how to:

- Create smooth, flicker-free screen movement
- Generate flashing "neon-sign" graphics
- Keep game scores
- Use random numbers in game design—and make your computer come alive as an opponent
- Zero in on random time delays—a challenge to even the most sophisticated arcade player

And much more.

Write Your Own Apple Games gives you all the skills you need to start designing your own original computer games for fun—and profit!

And because writing your own games gives you greater control of your Apple's numerical and graphic capabilities, you'll be opening the door to fantastic new possibilities for using your computer.

Write Your Own Apple Games should sell for over $1,000—the cost of 40 pre-packaged games.

But you can get ***Write Your Own Apple Games*** for only $12.95. That's less than 32 cents a game—and every game you write yourself is virtually free!

Start having some serious fun with your Apple computer. Send for your copy of ***Write Your Own Apple Games*** today.

MAIL TODAY TO:
CREATIVE COMPUTING PRESS
Dept. NR7H
39 East Hanover Avenue
Morris Plains, N.J. 07950

Please send me _____ copies of ***Write Your Own Apple Games*** for only $12.95 each, plus $2.00 shipping & handling per book. #2W.

Total amount $_____.

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A+ pipeline

MAC

▸ MAKE MILLIONS

Make Millions transports users to the corporate world of high finance and tests their business judgment with changing economic climates and unsettling labor conditions.

Make Millions provides the aspiring capitalist with all the management tools—stock quotes, newspapers, market research, spreadsheets, databases, and business consultants. *(List Price: $49.95)*

Requires: Macintosh

Scarborough Systems, Inc.
25 N. Broadway
Tarrytown, NY 10591
(914) 332-4545

CIRCLE READER SERVICE NO. **378**

II SERIES

▸ MICOLMON MACHINE-LANGUAGE MONITOR

A man-machine language interface and debugging tool, MicolMon gives clear display of registers, flags, and stack pointer during the trace of a program. Here is a partial list of what MicolMon can do for you: send display to printer (default to screen); trace a program through execution; disassemble a program; get a hex dump of memory; dump memory as ASCII characters; and set break points and get a clear dump of registers, counters, and status flags when executed. *(List Price: $29.95)*

Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive; DOS 3.3

Micol Systems
100 Graydon Hall Drive
Suite 2301
Don Mills, Ontario
Canada M3A3A9
(416) 441-3752

CIRCLE READER SERVICE NO. **379**

II SERIES

▸ WINDHAM CLASSICS

Designed for players ages 10 to adult, Windham Classics bring well-known literary classics to life by letting the player take the role of the main character. The Windham Classics series consists of four interactive fiction games—Treasure Island, Alice in Wonderland, Swiss Family Robinson, and Below the Root.

In Treasure Island the player assumes the role of young Jim Hawkins, whose goal is to outwit Long John Silver and win the battle for the gold on Treasure Island.

Alice in Wonderland allows you to journey through Wonderland's rabbit holes, tea parties, and croquet grounds as you race the clock to get out of the magical land before it vanishes.

Swiss Family Robinson lets you assume a key role in the survival of your family, shipwrecked on a desert island. To keep your family alive, you need to think creatively and explore freely. The island environment is rich and vast, with beaches, oak forests, and coconut groves.

Below the Root, based on the *Green Sky Trilogy*, begins where the trilogy leaves off. You must discover the secret of the Green Sky to save it from destruction. You need to explore the mysterious landscape both above and below the root. *(List Price: $26.95 each)*

Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive; optional joystick

Windham Classics
One Kendall Square
Cambridge, MA 02139
(617) 494-1200

CIRCLE READER SERVICE NO. **382**

II SERIES

▸ COUNTING PARADE, SUM DUCKS, AND THE SPINNAKER LEARNING FUN CLUB

Counting Parade for Apple-II-series computers helps children ages 3 to 6 learn to identify numerals and number values as they play a fun, colorful game involving a parade of friendly animals. It features two levels of difficulty, an extensive array of colorful animals that the player uses to build a parade, and colorful animation.

Sum Ducks is the next developmental step after Counting Parade. It teaches addition and subtraction within the context of a bright, colorful ring-toss game. Sum Ducks also includes a second game on the same disk—Prime Ducks—which teaches the fundamentals of multiplication and factoring.

The Spinnaker Learning Fun Club helps members get the most out of their computers and their Spinnaker games. Each member receives a special T-shirt, a membership card, and a subscription to the club's quarterly newsletter. The four-page newsletter includes articles on how to take care of a computer, answers to technical questions, and sneak previews of new Spinnaker games. Membership forms are available at retail stores. *(List Price: Counting Parade, $29.95; Sum Ducks, $29.95)*

Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive; joystick or mouse

Spinnaker Software
One Kendall Square
Cambridge, MA 02139
(617) 494-1200

CIRCLE READER SERVICE NO. **383**

II SERIES

▸ COMPUTER CHECKUP

Computer Checkup is a set of 14 diagnostic tests that let you locate and identify possible problems and equipment malfunctions in your Apple II, II Plus, IIe, or IIc. Each of the diagnostic programs tests a different component of your Apple system. Once you have run the tests, Computer Checkup lets you print the results so you have a record of any problems. *(List Price: $59.95)*

Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive; optional printer

Software Publishing Corporation
1901 Landings Drive
Mountain View, CA 94043
(800) 523-6982

CIRCLE READER SERVICE NO. **384**

II SERIES

▸ VIDEO STOCK MARKET

Video Stock Market is a simulation game for up to seven beginner-to-advanced-level stock-market enthusiasts. In the game, your Uncle John Henry has died, and his entire estate will go to the one speculator in seven who plays the stock market best. You speculate with up to seven stocks, and a discount broker is available to handle all transactions. The game has four levels of difficulty and numerous playing options. *(List Price: $29.95)*

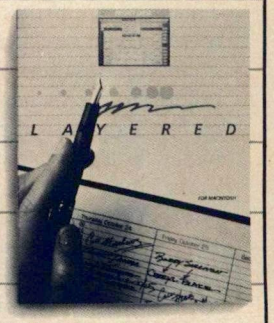
Requires: Apple II Plus, IIe, or IIc; 48K RAM; one disk drive

Computer Adversary Publishing
225 Ridge Court
Marion, IA 52302
(319) 377-4725

CIRCLE READER SERVICE NO. **385**

Now there's a better way for accounting firms to keep account of their CPA's.

NOW THERE'S FRONT DESK™



While your staff is using Front Desk™ to keep track of when they're doing what for whom, it keeps track of their time use in terms of hours spent and dollars generated per service. It's the resource scheduling software that understands time is money.

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JOBWARE FOR MACINTOSH.

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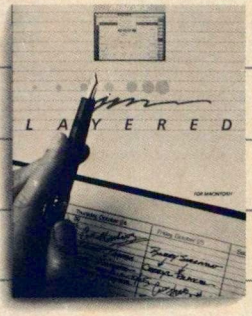
Front Desk will schedule appointments for an office full of psychiatrists. Then analyze them.

NOW THERE'S FRONT DESK™



If the way Front Desk schedules appointments for your doctors and your facilities doesn't excite your neurons, the way it analyzes time use in terms of hours spent and dollars generated per service will. These reports can help you modify your office's behavior for the better.

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II SERIES

▶ BANNER BUILDER

This program prints any message you want in letters approximately seven inches tall and three inches wide on continuous-feed printer paper. You can use it to make signs, posters, or party decorations. The letters are printed with solid rectangles if you have a printer with graphics capability, or with repeated X's if you have a text-only printer. *(List Price: $39.95)*

Requires: Apple II, II Plus, or IIe; 48K RAM; one disk drive; printer

Software Publishing Corporation
1901 Landings Drive
Mountain View, CA 94043
(800) 523-6982

CIRCLE READER SERVICE NO. **386**

II SERIES

▶ THE RUNNING COACH

This program creates a comprehensive running program designed specifically for you. It calculates and adjusts your daily workouts, using sophisticated scientific training methods. The Running Coach can maximize your running performance and reduce the risk of overly stressful workouts that can lead to injury. *(List Price: $69.95)*

Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive; optional printer

Software Publishing Corporation
1901 Landings Drive
Mountain View, CA 94043
(800) 523-6982

CIRCLE READER SERVICE NO. **387**

MAC

▶ MCFLIP

McFlip is based on the classic game of reversi, with an interesting twist. Within each of its four skill levels, McFlip improves as players do, maintaining a constant challenge. Players select the level of play from a pull-down menu. McFlip remains competitive by adjusting its skill within that level, depending on whether it wins or loses. All instructions are provided through the pull-down menus. *(List Price: $34)*

Requires: Macintosh

McCarron-Dial Systems, Inc.
P.O. Box 45628
Dallas, TX 75245
(214) 247-5945

CIRCLE READER SERVICE NO. **388**

II SERIES

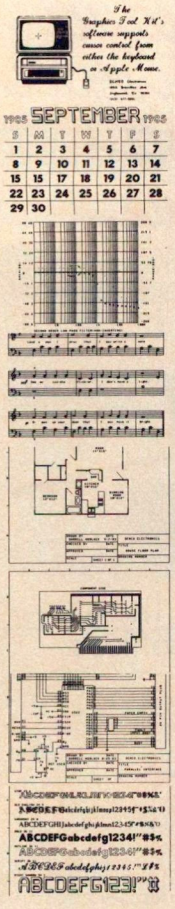
▶ J.K. LASSER'S YOUR MONEY MANAGER

J.K. Lasser's Your Money Manager provides financial statements, balance sheets, budget reports, and other essential information for financial planning. The program features simplified bookkeeping procedures, a four-function calculator, and a variety of graphs for analysis of current and projected trends. *(List Price: $89.95)*

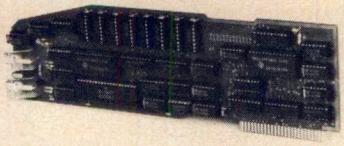
Requires: Apple II, II Plus, IIe, or IIc; 128K RAM; one disk drive; printer

Simon & Schuster
1230 Avenue of the Americas
New York, NY 10020
(212) 245-6400

CIRCLE READER SERVICE NO. **389**



HIGH-RES GRAPHICS SYSTEM FOR APPLE II COMPUTERS



- The **HARDWARE** has two continuous pages of 640 pixels by 384 lines of bit mapped monochrome graphics.
- Completely compatible with Applesoft High-Res commands.
- Some **SOFTWARE** features are rubberband line draw, pattern fill, plot, block move/duplicate, cut and paste, shape and font positioning, and insert standard Apple pictures.
- The software also contains a vector shape table and font maker/editor programs.
- The software supports the Apple mouse and keyboard for cursor control.
- Print a full 8 ½" by 11" page of graphics to a dot matrix printer capable of 80 dots per inch.
- Complete **HARDWARE** and **SOFTWARE** package including fonts and shape tables for only $595.00.

The **GRAPHICS TOOL KIT**

DEMCO Electronics
10516 Grevillea Ave.
Inglewood, CA 90304
(213) 677-0801

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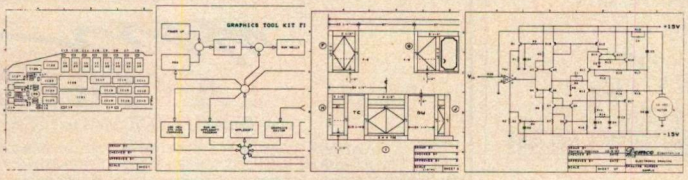

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Computer Publications Division

CALL 212-503-5115

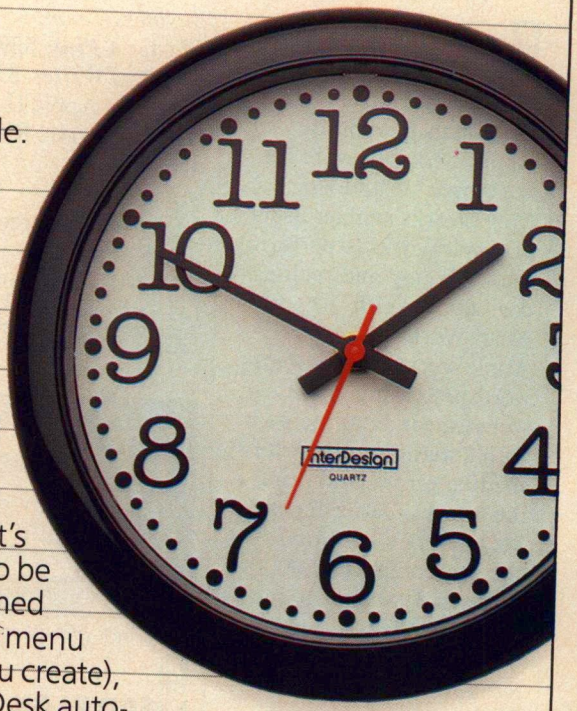
Front Desk. The better way to manage your most precious natural resource.

Front Desk™ is a time and resource manager for Macintosh™ that understands a simple fact.

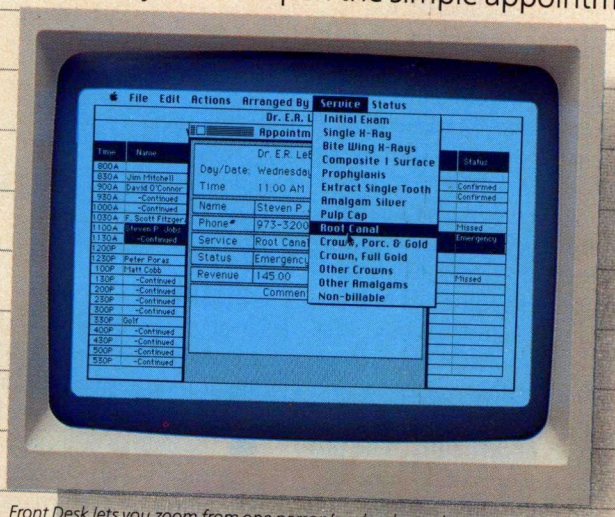
Time is money.

It'll help you coordinate the time use of lots of people. Or schedule facilities. Or loan out equipment. Or plan projects. Or track a sales staff's sales. Or whatever. For a major company. Or a one-man-show.

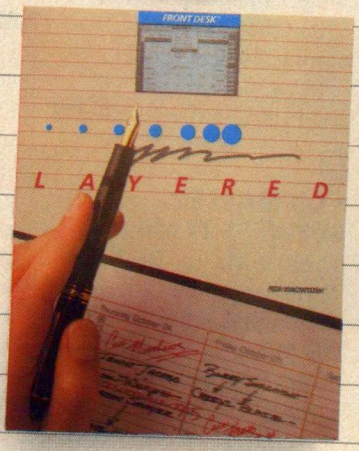
At first glance, it looks like a snazzy electronic appointment book. But Front Desk is no mere calendar. Not only does it organize *how* time is spent, it analyzes how *well* time is spent.

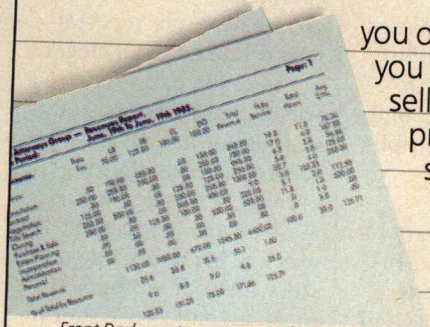


When you click open the simple appointment entry form and select the service that's going to be performed (from a menu that you create), Front Desk automatically calculates the proper fee or rate. Then at any time you can print out an analysis report for last month showing how many hours you or your staff spent—or how many dollars you brought in—by holding consultations, or selling wickets, or playing golf. And you can project how much you'll bring in on those services in the coming weeks or months.



Front Desk lets you zoom from one person's calendar to the next. Or zip from a monthly view to a weekly view to a single day view. For one person or everyone.





Front Desk creates reports analyzing time use in terms of hours spent—and dollars generated—per person, per service.

This lets you see where your profits are coming from. Where your time is going. You can spot trends. Nip unprofitable ventures in the bud. And decide who gets bigger Christmas bonuses. In short, you'll get more done. In less time.

So dash down to your local computer store today for a look at Front Desk. And buy yourself some valuable time.

LAYERED

JOBWARE FOR MACINTOSH.

Layered Incorporated, 85 Merrimac Street, Boston, MA 02114 (617) 423-9041

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CIRCLE 462 ON READER SERVICE CARD

MEGAWORKS

Designed to accompany Megahaus Corporation's AppleWorks software for the Apple IIc and IIe, MegaWorks enables users of AppleWorks to perform mail merging and spelling correction. With MegaWorks, users of AppleWorks can combine word-processing and spreadsheet data, merge it with a mail list, check for spelling errors, and print the result in letter format. MegaWork's spelling checker contains 40,000 words and expands to include 10,000 additional words. *(List Price: $125)*

Requires: Apple IIe or IIc

Megahaus Corporation
5703 Oberlin Drive
San Diego, CA 92121
(619) 450-1230

CIRCLE READER SERVICE NO. **390**

DB MASTER BUSINESS TEAM

The DB Master Business Team for Apple II-series computers combines the DB Master 4 Plus database-management system with the DB Master Business Writer word-processing program.

DB Master 4 Plus has a built-in report generator and includes a file converter that converts files from PFS:File and VisiFile without reentry of data.

Business Writer is a word-processing program for professionals who need to create letters, memos, and sophisticated mail-merge operations. Business Writer allows for direct text merge with files created by DB Master, AppleWorks, PFS:File, and VisiFile. *(List Price: DB Master Business Team, $350; DB Master 4 Plus, $295; DB Business Writer, $149)*

Requires: Apple II, II Plus, IIe, or IIc; 64K RAM; one disk drive

Stoneware
50 Belvedere Street
San Rafael, CA
94901-4870
(415) 454-6500

CIRCLE READER SERVICE NO. **391**

Lead Pack Marathon

LEAD PACK MARATHON

Lead Pack Software has developed a computer strategy game for one or two players that realistically simulates marathon racing at the world-class level. The game offers two playing options—International, in which you represent the USA against other countries, and Personalized, in which you enter your name and run against a record holder or a best friend. Each athlete possesses different strengths and abilities, and you must make tactical decisions as you run. Realistic high-resolution graphics provide different viewing angles of your progress for every mile of the 26.2-mile race. *(List Price: $39.95)*

Requires: Apple II, II Plus, IIe, or IIc

Lead Pack Software Company
P.O. Box 399
Exeter, NH 03833
(603) 772-5776

CIRCLE READER SERVICE NO. **392**

AVANT-GARDE MATH PROGRAMS

Avant-Garde has introduced four educational math programs for children. The Magic Cash Register teaches children about money by letting them become cashier of their own make-believe store. The program is easy to use—a short story/coloring book introduces children to the cash register, and a friendly wizard on the screen tells them what to do at each step. Children can choose what they will sell in their store, for how much, and how they will give change after the purchase.

Introductory Algebra provides thousands of equations for students in grades 8–12 to solve. The program offers a choice of 24 types of operations, each with 3–4 levels of difficulty. The program scores and times lessons automatically, so students can compete against each other or against the clock. The exercises include the distributive law, equations with brackets, substitution, binomials, trinomials, multiplication and division of terms, and more.

A follow-up program to Introductory Algebra, Intermediate Algebra explores special products and algebraic factors, including the distributive law, polynomials, squaring, grouping, and more. The program offers instant on-screen scoring, sample problems, three levels of difficulty, and hundreds of exercises.

Finally, Logic Workout introduces students to classical logic and syllogisms. Designed for students at eighth grade through college level, the program provides a short tutorial on theory and problems from each of nine basic proof patterns. You can work with angle logic, picture/symbol logic, or random combinations of both. *(List Price: $34.95 each)*

Requires: Apple II, II Plus, or IIe; 48K RAM or 64K RAM (The Magic Cash Register only); one disk drive

Avant-Garde Publishing Corporation
1907 Garden Avenue
P.O. Box 30160
Eugene, OR 97403
(503) 345-3043

CIRCLE READER SERVICE NO. **393**

SUSPECT

Suspect, a whodunit, is the latest release in Infocom's line of interactive-fiction games in which players direct the course of a preprogrammed novel by responding to the program with conversational English commands. In Suspect, you are a newspaper reporter who is invited to an elegant masquerade ball. You are a friend of the hostess, and your editor has asked you to record the event. During the evening, a murder occurs, and you are the suspect. In order to bring back a good story for your editor, you must not only prove your innocence but must also solve the murder. The package includes a booklet and various clues to help you solve the crime. *(List Price: $44.95)*

Requires: Apple II, II Plus, or IIe

Infocom, Inc.
55 Wheeler Street
Cambridge, MA 02138
(617) 492-1031

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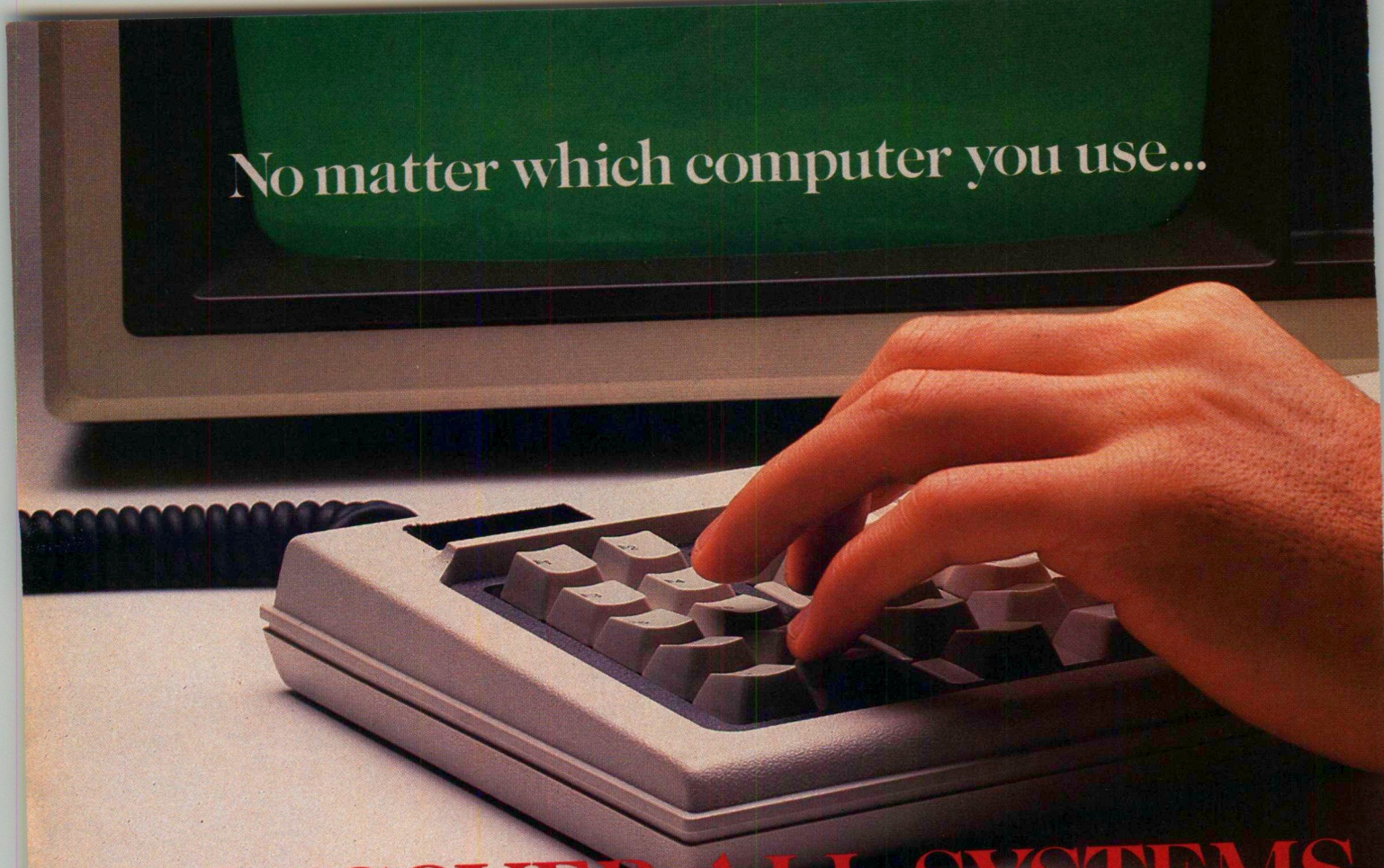

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AM8Z185

II SERIES

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U.S. Adventure is an educational game that applies the principles of adventure gaming to an interactive trip around the United States. Players learn about American history, geography, presidents, and states and capitals while they score points and fill in map screens. *(List Price: $34.95)*

Requires: Apple II, II Plus, or IIe; 48K RAM

First Star Software, Inc.
18 East 41st Street
New York, NY 10017
(212) 532-4666

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II SERIES

HEALTH INSURANCE FORM WRITERS

Two programs—the Dental Insurance Form Writer and the Medical Insurance Form Writer—that allow you to prepare Universal Health Insurance Claim Forms on your computer are now available from Andent. The programs enable you to prepare (preauthorize), save to disk, reload, edit, and then print forms as many times as you wish. You can thus create a master form for each patient or family and save it on disk. Each disk can accommodate more than 100 families and can be copied for backup purposes. You can also list and modify the programs to suit your specific needs. *(List Price: $100 each)*

Requires: Apple II, II Plus, or IIe; 48K RAM; DOS 3.3; one disk drive

Andent, Inc.
1000 North Avenue
Waukegan, IL 60085
(312) 223-5077

CIRCLE READER SERVICE NO. **339**

MAC

MORE MACCESSORIES

Kensington Microware has announced two new software packages in its Maccessories product line—Professional Type Fonts for Text and Professional Type Fonts for Headlines. The two packages each contain the same 16 fonts, which are styled after well-known industry standards such as Helvetica and Optima. Professional Type Fonts for Text contains fonts in sizes from 12 to 24 point, and Professional Type Fonts for Headlines offers fonts in larger sizes, from 24 to 72 point. *(List Price: Professional Type Fonts for Text, $49.95; Professional Type Fonts for Headlines, $69.95)*

Requires: Macintosh, 128K RAM or 512K RAM (for headline sizes)

Kensington Microware Ltd.
251 Park Avenue South
New York, NY 10010
(212) 475-5200

CIRCLE READER SERVICE NO. **340**

MAC

HARDISK ACCOUNTING SERIES FOR THE MACINTOSH

Macintosh computer owners can now perform accounting and financial-management functions with the Great Plains Hardisk Accounting Series. The Macintosh software, which comprises modules that you can integrate fully or use separately, is the same product as that currently available for the Apple IIe and III computers. Five modules in the series—General Ledger with Financial Reporting and Budgeting, Accounts Receivable, Accounts Payable, Payroll, and Inventory Management with Point of Sale Invoicing—are currently available. *(List Price: $695 each module)*

Requires: Macintosh, 128K RAM, Tecmar hard disk

Great Plains Software
1701 S.W. 38th Street
Fargo, ND 58103
(701) 281-0550

CIRCLE READER SERVICE NO. **341**

MAC

TRIPLE PLAY GAME DISK NUMBER ONE

Triple Play, from STEL Enterprises, offers three classic board games—Backgammon, Mancala (a two-player strategy game), and Deduce (a version of a pen-and-paper game of logical deduction)—on disk for the Macintosh. Players can use either menus or control keys to select such options as a choice of skill levels, saving the game, altering the rate of movement of the playing pieces, undoing moves, reviewing the game, marking last moves, and suggesting good moves. *(List Price: $39.50)*

Requires: Macintosh

STEL Enterprises
P.O. Box 6354
Lafayette, IN 47903
(317) 742-5369

CIRCLE READER SERVICE NO. **343**

II SERIES

PERSONAL PLANNER

The Personal Planner is a financial program that you can use to calculate tax liabilities for 1983 through 1986. For any given year, the program can store up to four different sets of assumptions about your financial status and can then print two reports, one showing comparisons between years and one that compares options. You can also use the Personal Planner to check calculations on 1040 federal income-tax forms, determine earned-income credit, and calculate commonly used tax-return schedules and forms. The program comes with a 15-page instruction booklet and a complete set of input sheets. *(List Price: $49)*

Requires: Apple II, II Plus, or IIe

CPAids, Inc.
1061 Fraternity Circle
Kent, OH 44240
(216) 678-9015

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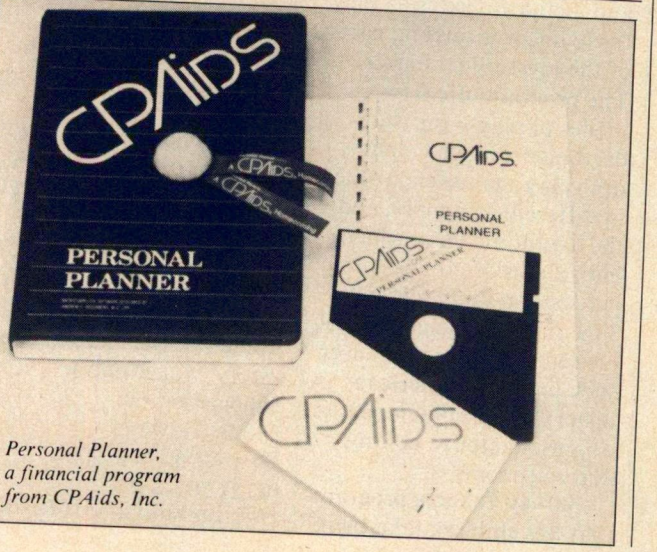

Personal Planner, a financial program from CPAids, Inc.

II SERIES

COMPANION

A word-processing utility for the Apple IIe and IIc, Companion works in conjunction with the Apple Writer II word-processing program. Features of the Companion program include mailing-list creation and editing, form-letter generation, envelope addressing, mailing-label printing, and conversion of lists created by AppleWorks or Quick File II. Companion is available in DOS 3.3 or ProDOS format. *(List Price: $29.95)*
Requires: Apple IIe or IIc; 48K RAM; one or two disk drives; Apple Writer II
Companion Software
1956 McCollum Street
San Luis Obispo, CA 93401
(805) 544-4984
CIRCLE READER SERVICE NO. **345**

II SERIES

SCHOLASTIC PROGRAMS

Scholastic has released four new educational programs for children. Mystery Sentences, a computerized version of Hangman, challenges children's verbal and analytical skills as they try to uncover missing parts of the mystery sentences. The program offers two modes of play—the Standard mode, in which children play against each other in different sentences, and the Secret mode, in which individuals or groups compete on the same sentence. The program includes sample sentence files that cover such topics as American history, geography, word origins, anatomy, botany, and astronomy.

Survey Taker, a program that lets children take their own surveys and print the results, is designed for children ages 9 and up. By analyzing the results of their surveys on colorful bar charts and on detailed table graphs, children learn how to analyze simple statistics and improve their graph-reading skills.

In Kids at Work, children team with the construction kids—a pair of animated workers—to design and build their own city and country scenes. Children maneuver the construction worker around objects and choose buildings, trees, and cars to place in the city scene; a red-haired pigtailed farm girl helps them draw barnyard scenes, chicken coops, and farm animals. The program's Make-A-Shape option allows children to create their own full-color graphics shapes and objects.

Story Maker: A Fact & Fiction Tool Kit, designed for children of 8 years and up, enables them to write and illustrate their own stories. Children can either draw their own graphics or select from a gallery of more than 60 pictures of animals, vehicles, plants, and fantasy creatures. Children can also choose from eight different typefaces for text and can combine text and graphics on the same page. *(List Price: Mystery Sentences and Story Maker, $39.95; Survey Taker and Kids at Work, $24.95)*
Requires: Apple II, II Plus, or IIe; 64K RAM; joystick, Apple Mouse, or KoalaPad (Story Maker only)
Scholastic, Inc.
730 Broadway
New York, NY 10003
(212) 505-3497
CIRCLE READER SERVICE NO. **346**

MAC

DA POMA GB

This grade-book application program for the Macintosh allows teachers to maintain scores, calculate and assign grades, and generate reports. Standard or adjusted grade break points can be used in calculating grades. Users can enter an unlimited number of scores in the grade book and print reports based on raw scores, individual grades, or class grades. *(List Price: $150)*
Requires: Macintosh
Da Poma, Inc.
P.O. Drawer H
Hondo, TX 78861-0240
(512) 426-5932
CIRCLE READER SERVICE NO. **348**

II SERIES

THREE NEW GAMES IN MATH POWER SERIES

SRA Software has released three new games—Beano, Amusement Park, and Number Chase—in its Math Power Series of educational games designed for second-grade through adult-level users. The games feature fast-paced, color computer graphics and several levels of difficulty. In Beano, players develop skills of mental computation and strategy by combining numbers mathematically to match numbers on a computer-generated grid. Amusement Park is a business-simulation game that develops enumerative, computational, and logical thinking skills. Number Chase features mysterious secret numbers that players uncover as they enhance their math skills. *(List Price: $39.95 each)*
Requires: Apple II Plus or IIe, 48K RAM
SRA Software
155 N. Wacker Drive
Chicago, IL 60606
(312) 984-7000
CIRCLE READER SERVICE NO. **349**

Three new games from SRA Software

MAC

AZTEC C

The Aztec C68k-c software-development system for the Macintosh is a complete programming environment that includes a compiler, full-screen editor, macro assembler, linker, librarian, toolbox, and standard UNIX I/O library.

The C compiler supports in-line assembly code, optional assembly-language source files, register variables, and in-line traps for ROM calls. The full-screen editor is similar to the Berkeley UNIX editor Vi. You can also use MacWrite to create source files. The macro assembler translates assembly-language source output from the compiler into relocatable object code and recognizes all Motorola 68000 mnemonics. *(List Price: $499)*
Requires: Macintosh
Manx Software Systems, Inc.
P.O. Box 55
Shrewsbury, NJ 07701
(800) 221-0440
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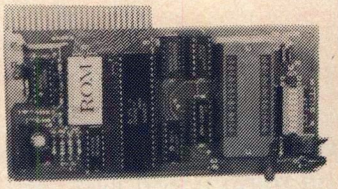

AEB-2

KEY: a = Apple II or II+
b = Apple *IIe*

Part No.	Description	Key	Price
ARC-16K	16K RAM Card	(a)	$39.95
AZ80-1	Z-80 Card* For CP/M related programs	(a,b)	$49.95
AWC-1	Wild Card™— A software back-up tool.	(a)	$49.95
ASC-232	RS232 Card — Standard Serial Interface	(a,b)	$49.95
AEB-2	EPROM Burner Card Allows copy of standard EPROMs (2708, 2716, 2732 and 2764)	(a,b)	$69.95
A80-C	80-Column Card with soft switch	(a)	$74.95
ASSC-P	Super Serial card (With printer mode, xon, xoff, etc.) Full RS232C capabilities.	(a,b)	$99.95
APC-16K	Printer Card Parallel printer interface w/16K buffer expandable to 64K	(a,b)	$99.95
APC-64K	Printer Card Same as above with 64K buffer.	(a,b)	$129.95
ARC-128K	128K RAM Card For use with special software.	(a)	$179.95

APPLE™ Compatible 5¼" Disk Drive and Controller Card

• Uses Shugart SA390 mechanics • 143K formatted storage • Color matches Apple Computer • Works with Apple Controller or other Apple-compatible controllers (ACC-1) • Complete with connector — just plug into your disk controller card • 35 tracks • Size: 6"W x 3½"H x 8-9/16"D • Wt.: 4¼ lbs.

ADD-514 (Disk Drive) **$169.95**

ACC-1 (Controller Card) **$49.95**

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• Uses Chinon Pinch-type mechanics • 163K unformatted • 35 tracks • Super quiet • Works with Apple Controllers or other compatibles (ACC-1) above • Complete with connector — just plug into your controller • Size: 5¾"W x 1⅝"H x 8"D • Wt.: 4 lbs.

ADD-12. . . . $179.95

APPLE™ *IIc* Compatible 5¼" Half-Ht. Disk Drive

• Same specs as ADD-12 (above) except no controller necessary.

ADD-IIc. NEW! $189.95

80-Column plus 64K RAM for your APPLE *IIe**

Now you can double the memory capacity and get an 80-column display format for your APPLE *IIe** computer at an affordable price. Just plug the JE864 card into your APPLE* and expand your display to 80 characters per line. Perfect for word processing. The JE864 also features 64K bytes of additional memory to allow programming not possible with standard APPLE *IIe** computers. Complete documentation included.

Board: High density board design squeezes 64K bytes of RAM onto a 2½" x 4½" board • Fully tested to assure proper operation.

Uses: Word processing — displays 1000 more characters per screen • Extra memory allows running of extremely large programs • Ultra High Resolution Graphics capability.

JE864. . . . . $99.95

APPLE Keyboard and Case for Apple II and II+*

Special Functions!

KEYBOARD (KB-A68):
• 68 Keys • 15-Key Keypad • Direct connection with 16-pin ribbon connector • Special functions on number keys, including cursor controls, color demo, and one-touch disk catalog • Metal baseplate for durability (with 6 mounting holes) • Color (keys): white/grey • Size: 14½"L x 5½"W x 1½"H

CASE (EAEC-1):
• Accommodates KB-A68 • Pop-up lid for easy access • Fits power supply and motherboard too • Size: 15½"W x 18"D x 4¼"H

Part No.	Description	Price
KB-EA1	Apple Keyboard and Case.	$134.95
KB-A68	68-Key Apple Keyboard only.	$ 79.95
EAEC-1	Expanded Apple Enclosure Case only.	$ 59.95

Numeric/Auxiliary Keypad for your APPLE *IIe** *Visi Calc Users!*

The JE614 is a newly introduced numeric/auxiliary keypad for the APPLE *IIe*.* It offers the flexibility of a 10-key pad and the convenience of 23 directly accessible functions. Screen manipulating functions make word processing a snap and cursor controls make the keypad ideal for VisiCalc** users. The JE614 Keypad is housed in a durable metal enclosure and is color-coordinated with your APPLE *IIe* computer. Operation of the keypad can begin within minutes from unpacking. Special functions include: Home, Clear, Clear to End of Screen, Scroll-Up, Scroll-Down, Tab, Delete, Left, Right, Up and Down. Each key has auto-repeat. Size: 5⅞" L x 4-3/16" W x 1¼" to 2½" Slope.

JE614. . . . . $59.95

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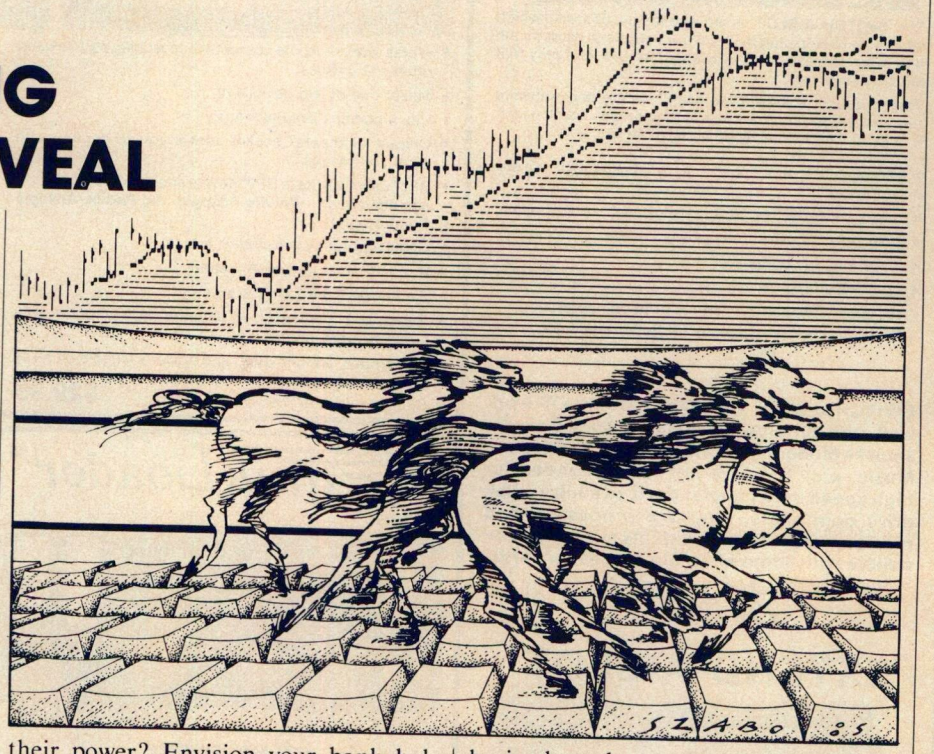
CIRCLE 279 ON READER SERVICE CARD

WHAT MOVING AVERAGES REVEAL



Two kinds of people analyze the stock-market—fundamentalists and technicians. Fundamentalists believe that strict adherence to rules—in this case, security analysis—is good for the soul and the bank balance.

Technicians, on the other hand, believe in the "black art" of technical forecasting, or "market alchemy." They use spells and techniques with names such as oscillators, chanelizers, and filters.

As you might expect, technicians—sometimes referred to as gnomes—are a misunderstood lot (soothsayers usually are). To modify this situation, let's examine one of their most popular tools—the moving average—and use the Apple to harness its power.

Moving Averages

Transport yourself back to the fifth grade—to the one-piece desk, civics, and math. Remember the lesson on finding simple averages: take a series of numbers, add them together, and then divide by the number of numbers in the series.

Now move ahead a few years to junior high school—boy-girl parties, your first dance, and more math. This time, let's take that simple average and change it a little. By taking out the older numbers in the series and adding in new numbers, we get an average that "moves." The number of numbers (or observations) that we keep in the calculation determines the length, or range of the average. So, when your math teacher Mrs. Macgillicuddy told you to use the last ten observations, and drop off the eleventh one, she was teaching you about moving averages.

Pictures from Your Checkbook

Moving averages are no more complicated than that. But what gives them their power? Envision your bank balance. It goes up and down every time you write a check or make a deposit. If you tried to analyze the deposit and payment patterns from the numbers in your register, you would probably go slightly bonkers. Using numbers or tabular information doesn't help you see a pattern, but a graph does.

If you have ever turned raw numbers into graphs, you know how time-consuming and frustrating it can be.

Think of graphing the information in your check register onto a piece of graph paper, with the horizontal axis as *time* and the vertical axis as *dollars*. The resulting line graph would show the changes in your account on a daily basis, but the pattern—if there was one—would remain obscured.

A moving average, though, would show a pattern, averaging out the changes in the numbers and creating a smooth, flowing line.

What often happens—but should be avoided if possible—is that people who concern themselves with securities and use moving averages use a range (or length) that is incorrect for the security they are interested in. The moving average must be constructed to magnify—not conceal—data in the numbers. A way to choose the correct range is to look at the history of the security and experiment with different ranges to see which one fits best so that the range does not product a flowing line that obscures the information you are seeking.

Trader's Forecaster

If you have ever turned raw numbers into graphs, you know how time-consuming and frustrating it can be—but your Apple loves to do it. As with any task you assign to your machine, you have to provide it with the proper

GUSTAV SZABO

SCRG PRODUCTS FOR THE APPLE COMPUTER

SWITCH-A-SLOT

$179.50

The **SWITCH-A-SLOT** is an expansion chassis, which allows the user to plug in up to four peripheral cards at one time. One of these cards is selected for use, and only that card draws power.

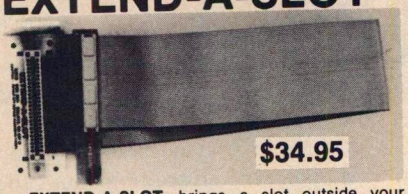
This product is especially useful where the software requires the printer to be in a particular slot, and the user wishes to choose between two or more printers.

- Allows up to four peripheral cards to be plugged into one peripheral slot.
- User selects desired card by front panel rotary switch.
- Only selected card draws power.
- Plugs into any peripheral slot.
- Saves wear and tear on delicate connectors.
- 18" cable connects Switch-a-slot to computer.

New—resistive terminations for better response

SWITCH-A-SLOT and EXTEND-A-SLOT work well with all slow to medium speed cards, such as Modems, Printers, Clock, 80 Column, Music, etc. They are not recommended for high speed data transfer devices such as disk drive controllers, alternate processor, and memory cards. These products may be incompatible with some alternate processor cards.

EXTEND-A-SLOT



$34.95

The **EXTEND-A-SLOT** brings a slot outside your APPLE™, allowing an easy change of cards. The 18" flex cable is long enough to allow placement of the card in a convenient location. The high quality connectors are gold plated for reliability.

The perfect accessory for:

Owners of large numbers of I/O expansion cards—keep your frequently used cards installed. Use the EXTEND-A-SLOT for the others.

Technicians—easy access to test points on accessory cards under actual operating conditions.

Experimenters—make easy changes to cards while card is installed.

EASY TO USE—just plug it in as you would any expansion card, then plug your card in. When you want to change cards, do it easily outside the computer, without the wear and tear on the computer expansion slot.

OTHER PRODUCTS

D Manual controller. Gives complete control over the $C000 through $C0FF range in hardware. Can be switched while program is running. $89.50.

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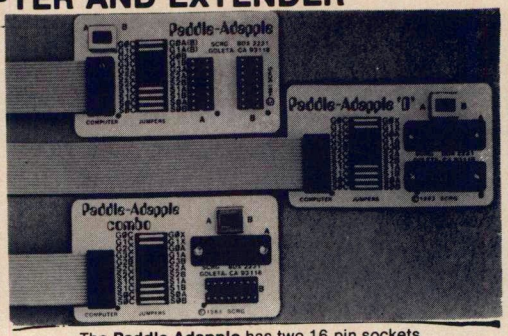

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The **Paddle-Adapple** has two 16 pin sockets

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For Apple / /e and / /c

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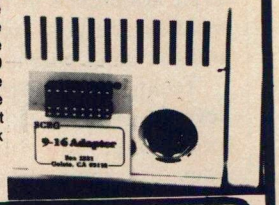

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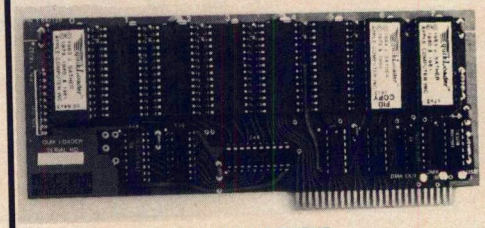
quikLoader™



FAST AND CONVENIENT

The quikLoader is the *fastest* way to load programs. **BAR NONE!** Programs can be loaded in fractions of a second. More importantly, DOS is instantly loaded every time the computer is turned on. Integer is even loaded in the language card. This process takes less than a second, saving valuable time. Frequently used programs are available *instantly* when you need them, without having to look for the disk, or hoping that the lengthy disk loading procedure goes smoothly.

To run a program from the quikLoader, bring up the quikLoader catalog (Q-reset), and the names of the programs will be displayed, along with an index letter. Pressing the index letter will instantly load and run the program.

Up to 23 programs on the quikLoader can be displayed on the screen at one time. If you have more programs, you may scroll through the catalog in either direction.

The quikLoader is **ideal** for applications requiring a dedicated computer. Your program can be automatically loaded and run at "power-up".

PROGRAMMING EPROMS

Putting your own programs on the quikLoader is easily done, using a separate EPROM programmer such as the **PROmGRAMER.** For APPLESOFT, INTEGER, or single machine language files, no programming knowledge is necessary. You **will** need experience if you want to save copy-protected or complex programs. The amount of experience necessary depends on the complexity of the program.

COMMERCIAL PROGRAMS

If you have a program that is valuable, it will become **more** valuable when it is instantly available to you. We are actively seeking licenses from software publishers to allow their popular programs to be made available for the quikLoader. Independent authors are encouraged to write programs suitable for the quikLoader. If the author wishes, we will market the program (with appropiate royalties), or the author can take care of all marketing. In either case, we will make known to our customers the availability of these programs.

We start your library of programs with the most popular utilities on the card, FID and COPYA. Now, if you have to copy a disk, you don't have to search for the master disk. You can start copying within 3 seconds after turning on the computer.

We are currently licensed to sell several very popular programs on EPROM. **DOUBLE—TAKE** by BEAGLE BROS., and **COPY][PLUS** by CENTRAL POINT SOFTWARE. The introductory price for DOUBLE—TAKE is $45.00. This includes the program exactly the same as you would buy it at your dealer for $34.95 (including disk and documentation), and a programmed 27128 EPROM (worth about $25.00). COPY][PLUS cost $65.00. This includes the original program (worth $39.95) and **two** programmed 27128's.

Other programs available directly from us or the publishers are, **BARKOVITCH I/O TRACER AND SINGLE STEP TRACE, MICRO/TYPOGRAPHER** from **TIDBIT SOFTWARE, ECHO** speech synthesizer software from **STREET ELECTRONICS,** and **MERLIN** assembler, from **ROGER WAGNER PUBLISHING.** More commercial programs are now in the works.

MEMORY CAPACITY

The quikLoader has eight sockets for EPROMs. These sockets can accommodate standard EPROMs from 2716 to 27512. These types can be freely intermixed. The memory capacity of the quikLoader depends on the EPROMS used. For example, the 2716 can hold 2K of programs, and the 27512 can hold 64K. (Frankly, the current costs of the 27512 is prohibitive,but should come down drastically in the next year.) At this writing, the least cost-per-bit is provided by the 2764, which can hold an 8K program. Using these "chips", the quikLoader becomes a 64K ROM. Using larger capacity EPROMs allows it to become a 128K, 256K, or even a 512K card. If more memory capacity is needed, the quikLoader operating system supports multiple quikLoaders.

INCREASED DISK CAPACITY

Since DOS is loaded from the quikLoader every time the computer is turned on, it is not necessary to take up valuable disk space with DOS. This will give you more than 5% additional space for programs and data on your disks.

ABOUT THE DESIGNER

The quikLoader was designed by Jim Sather, author of UNDERSTANDING THE APPLE][(forward by Steve Wozniak), published by QUALITY SOFTWARE (21601 Marilla Street, Chatsworth, CA 91311 (818) 709-1721).

SYSTEM REQUIREMENTS

The quikLoader plugs into any slot of the APPLE][+ or //e. If used in a][+, a slightly modified 16K memory card is required in slot 0. A disk drive is required to save data.

DOS, INTEGER BASIC, FID, and COPYA are copyrighted programs of APPLE COMPUTER, INC. licensed to Southern California Research Group to distribute for use only in combination with quikLoader.

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PROmGRAMER™

The **PROmGRAMER** will read or program any of the standard single-volt EPROMS from the 2708 to the 27512. Features include:

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instructions (software) to get the job done.

We'll use the Trader's Forecaster, one of three packages in the Winning on Wall Street series, from Summa Software of Beaverton, Oregon.

Trader's Forecaster is a combination forecasting/technical-analysis charting program. Besides doing moving averages, it also does exponential smoothing, adaptive filtering, Least Square Fit method (linear regression), ⅓–⅔ speed resistance lines, trading bands, mid-channel support/resistance lines, volume indicators, and point and figure charting. The information it uses is stored in Winning on Wall Street's librarian, the Trader's Data Manager.

The Trader's Data Manager collects and stores a variety of data. We will be using high, low, close, open, and volume information, which you can enter from the financial pages of your newspaper via your fingertips, or through an automatic connection to the Dow Jones News/Retrieval Service. In either case, the end result is that the program stores on a diskette the information on the stocks you're interested in, where the Trader's Forecaster can find it.

To construct the moving average, you retrieve the data on the stock that you're interested in and tell the Trader's Forecaster the range of the average. Within seconds, the Trader's Forecaster calculates and displays the average over, and in relation to, the "raw" high, low, close, and volume information (see figure 1). But what does it mean?

Place Your Bets

Reading moving averages is a lot like handicapping racehorses. It takes years of skill, continuing refinement, and luck. The numbers can say one thing, but the stock—like a racehorse—often does something else.

There is a method in this madness, though. It's called the crossover point.

The crossover point is not a Robert Ludlum novel. It is the point at which two moving averages of different lengths cross one another, as they do at point A on figure 1. (Some analysts consider that a crossover occurs when a single moving average crosses its own low or high, but we are using multiple moving averages.)

To illustrate, let's consider a 10-day and a 30-day moving average.

Mathematically speaking, the 10-day average responds more rapidly to changes in the price of the underlying stock. Thus, it tracks the stock's price fluctuations more closely than the 30-day average does. This speed is both a help and a hindrance. The market moves quickly, so the faster the average responds, the better. The problem is that the average, like the market, can

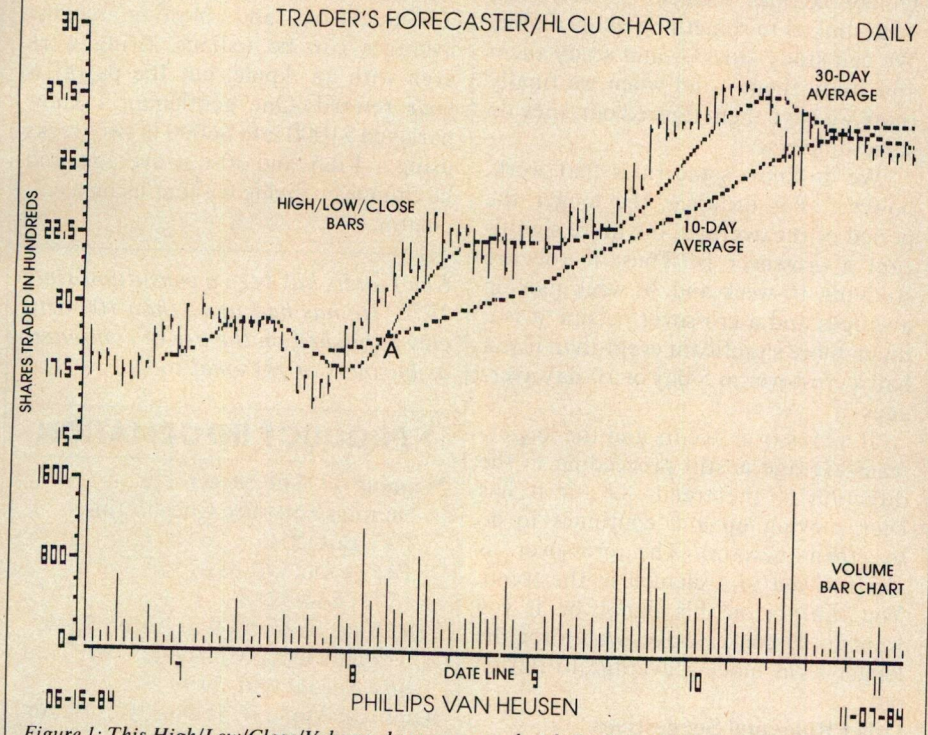

Figure 1: This High/Low/Close/Volume chart, generated with Trader's Forecaster, displays both a 10-day and a 30-day moving average of the Phillips Van Heusen stock. A "buy" signal is indicated on 8-8-84 at 21 1/8 when the short term moving average crosses above the longer-term average. A "sell" is indicated on 10-26-84 at 26 3/8 when the 10-day moving average falls below the 30-day average. The result is a 25% gain in less than 80 days.

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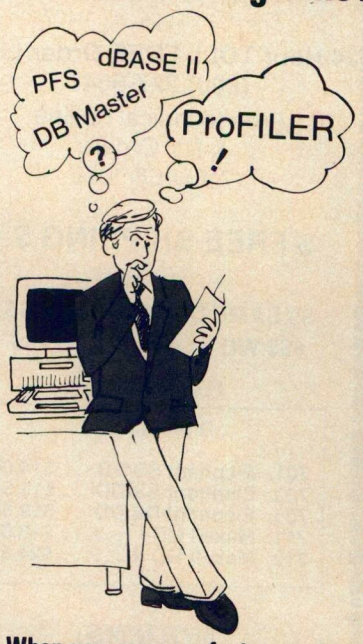

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fluctuate, change quickly, and then reverse. The result could be money lost.

The 30-day average graphs the stock's longer-term trend. It shows the areas of support (price lows) and resistance (price highs) that the stock is moving within. If a stock breaks through one of these barriers, especially on a term average even longer than 30 days, it is a clear sign that something is happening.

If the breakthrough occurs at the resistance point, odds are that the stock will go up. If it occurs at the support point, watch out—the stock is looking for a new low, and you don't want to be there when it finds it (unless you sold short or speculated that the stock would go down). Now consider together the 10-day, fast-responding average and the 30-day, longer-term, trend-setting average.

The Payoff

When the shorter-term average crosses over the longer-term average, pay attention. Should the 10-day average cross the 30-day average, going up, it might be a signal that the price of the stock will be rising, and thus it is a good time to buy. If the opposite occurs (the 10-day crosses the 30-day going down) it probably means the stock is going to fall, and you better be wearing your parachute.

Why do I say *might* and *probably*? Unlike the tides, the behavior of a stock is not linked to something quantifiable. We can study stocks—and study them and study them—and when we finally think we have them figured out, they do something else.

We do know some rules that work, however. For instance, the longer the period of the average, the more significant a crossover is. Thus, if you are studying 10-week and 30-week moving averages and a crossover occurs, it is a much more significant event than if you had a crossover in 5-day or 10-day averages.

If a crossover occurs and the longer-term average is still proceeding in the direction of the trend—i.e., if it has been moving up and continues to do so—then beware. The crossover is alerting you to a change in the trend. You can act on this signal; or, if you want to be conservative, watch for the longer-term moving average to flatten out.

Other Rules and Suggestions

Finally, moving averages do not an analysis make. Although many traders react only to moving averages, the safest bet is to use them in conjunction with other indicators—especially volume. Here are two quick rules of thumb to tide you over until we discuss volume in an upcoming issue: Beware of new highs on low volume or contracting volume, and watch for opportunities at price lows with expanding volume.

Worth the Reward

Moving averages are the most popular technical-analysis technique. They are easy to construct, simple to read, and valuable. Different ranges, or lengths, work for different stocks. You can't do the same analysis for every stock in the market and make money. You have to find which combination of

Although many traders react only to moving averages, the safest bet is to use them in conjunction with other indicators—especially volume.

averages works best for each stock. A new enhancement called strategy analysis in Winning on Wall Street does just this for single moving averages. Used by itself, it helps you improve your timing—and thus your profits.

Calculating and plotting moving averages can be tedious, tiring work even with an Apple, but the payoff is your reward. One gentleman I know parlayed $1000 into $6000 in two weeks using a 4-day and 30-day average, and he can't even divide without using a calculator. +

Ken Landis has been a consultant since 1978. He has had more than 100 articles published on the use of computers as business or personal tools.

▶ PRODUCT INFORMATION

Winning on Wall Street
Summa Software Corporation
P.O. Box 2046
Beaverton, OR 97075
(503) 644-3212

List Price: Trader's Forecaster, $249; Trader's Data Manager, $199; Trader's Accountant, $199

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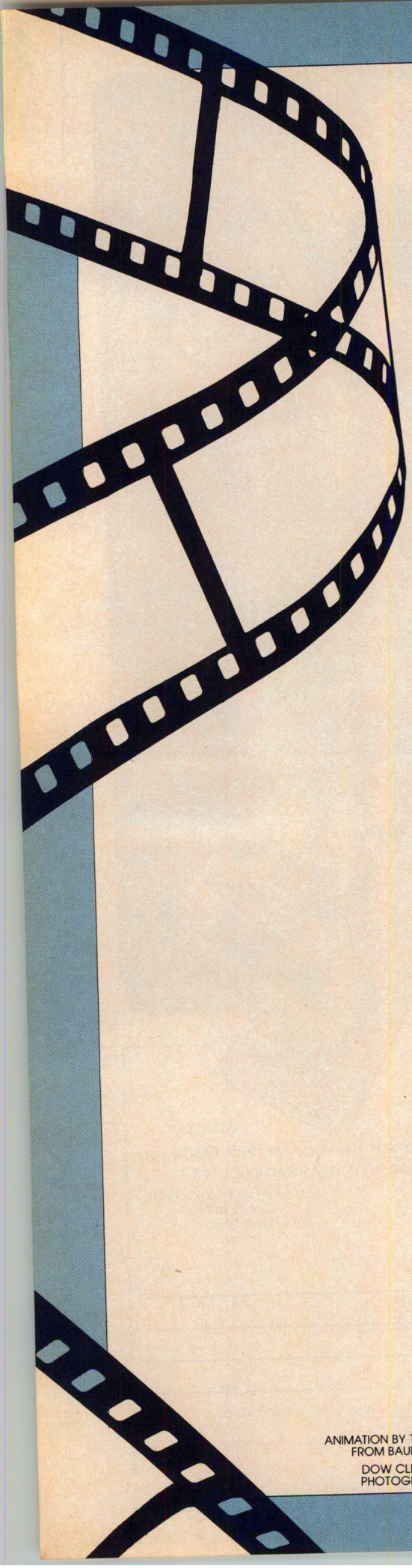

ANIMATION BY TAKE 1 FROM BAUDVILLE

DOW CLEMENT PHOTOGRAPHY

PART ONE OF

AN INTRODUCTION TO APPLE ANIMATION

MAKING IT MOVE

There's something special about animation. Whether it is a ball bouncing around the screen or a Disney classic, animation fascinates young and old.

Animation can educate or just entertain. How about an animated clock to teach your child how to tell time? Would letters dancing across a screen inspire someone to learn the alphabet? Why not send an animated greeting to a friend or colleague?

Animation can also enliven a business presentation. Imagine a dynamic pie chart with the wedges expanding to demonstrate how your company's market share increases over the years—or a bar chart with bars stretching up to reach your latest business goals.

Look no further than your Apple.

On Animation

Animation is illusion. An animator can take any object, real or drawn, and give it life by making it move. The illusion is in the movement—animations consist of still frames, rapidly displayed. Our eyes and brain transform subtle differences between frames into movement.

Animation is also an art. An animator must be able to visualize how the individual frames of the animation will fit together and how to maximize the illusion of movement. Computer animators must be especially creative, for every frame added to an animation uses memory.

Computer animation involves a simple animation cycle:

1. DRAW
2. ERASE
3. MOVE
4. GOTO 1

You can create effective animation on any of the Apple's screens: text, low resolution, high resolution, or double hi-res.

Describing animation is difficult if you don't illustrate it with animation, so find an Apple II computer and enter and run the simple program called TEXT.ANIMATE on page 156. Use Shift-M to type] on the Apple II and II Plus.

Use Control-C to stop this program.

Most of the program lines set up the animation: Lines 10–90 define array variables, lines 100–130 fill the screen with semicolons, and line 140 initializes a variable (H) and sets up a constant (V). Finally, the animation: Lines 150 and 160 represent the draw cycle, and lines 170 and 180 are the erase cycle.

Because the program is printing on the standard text screen, you use VTAB and HTAB for positioning. The horizontal position of the fish is stored in the variable H. Line 190 is the move component of the animation cycle. The program increments H and then checks to see if it's greater than the screen width. If it is, H is restored to the starting value. The constant V positions the pieces of the fish or the erase block.

Take a closer look at the animation cycle by slowing the program down. Then add this line to the program: 145 SPEED=150. (Afterwards, restore normal printing speed with the instruction SPEED=255 and delete line 145.)

My Friend Flicker

By slowing down the speed of the program, you can see why the animation flickers. There are moments when the screen is all background—no images other than semicolons appear.

To eliminate the flicker, make a small modification to the program. Don't forget to save the first version if you want a record of your work. Add an extra semicolon on the left side of each string by inserting the following program line:

KODAK EN 100 5039

```
95 FOR I = 1 TO 9:
   A$(I) = "; "+A$(I):NEXT I
```

Delete the erase cycle, lines 170–180.

Run this version, and you'll find that the flicker is gone. Even though you've deleted the erase cycle, you still have an erase function—the extra column of semicolons allows the animation to erase itself. The screen is never blank, and the flicker is eliminated.

You have just learned one of the secrets of high-quality, professional animation: Use the animation block itself to do the erasing. To do so, you have to increase the size of the block by the size of the maximum move on the side that is opposite that of the move. In TEXT.ANIMATE, the fish moves one character to the right; therefore, we need a column of one extra character on the left side of the character block.

For low-res or hi-res animation, you must add an extra column or row of pixels. Remember that the additional pixels or characters must be the same color as the background of the animation.

A GRaphic Surprise

Add the following lines to TEXT.ANIMATE and run the program again. This variant does not work properly on the 80-column screen.

```
6 POKE -16298,0:POKE-16304,0
7 POKE -16302,0:CALL-1998
```

These lines turn on the full-page low-res graphics mode and clear the screen. The same animation looks quite different now. The text and low-res screens share one area of memory in the Apple. The same information is displayed as text on the text screen and as pixels on the low-res screen.

If you wondered why we chose the combination of a bracket fish swimming in a sea of semicolons, try the program with other characters. The left square bracket and semicolon are two of the 16 text characters that produce stacked, same-color low-res pixels; most other text characters create a multicolored fish or ocean.

You can also animate the low-res page with the low-res commands PLOT, VLIN, and HLIN. To erase a plotted figure, plot it again in the same place, using the background color:

```
10 HOME:GR

20 Y=20

30 FOR X=1 TO 3

40 COLOR=3: PLOT X,Y

50 FOR D=1 TO 50: NEXT D

60 COLOR=0:PLOT X,Y

70 NEXT X

80 VTAB 22:PRINT "PRESS ANY KEY";

90 GET A$:TEXT:HOME
```

If you'd like to explore low-res animation, check the graphics library of your local Apple users' group. Many good, instructive, low-res animation programs are in the public domain.

Hi-Res Animation

The hi-res screens are useful for more detailed graphics and animation. Hi-res animation divides into two types, vector and block or raster animation. These types are differentiated by their display technology.

A vector is a line, an object with direction and magnitude (length), and vector-graphic systems draw lines. The most common vector-graphic display is an oscilloscope, and the arcade versions of Asteroids and Battle Zone have vector-graphic displays. In vector-graphic displays, the electron gun at the rear of the video tube draws the graphic—only the graphic. It never draws on the blank areas of the screen.

The Apple has a raster display, however; the electron gun scans across each line on the screen, turning on pixels where necessary for the graphic. Because our TEXT.ANIMATE fish was designed in a block, with all pixels defined as being on or off, the animation is a block or raster animation.

You can create hi-res block animations similar in concept to the fish animation with a hi-res character generator such as HRCG in the DOS Toolkit from Apple or with a dedicated animation system. If you use standard Applesoft shape tables, you can simulate vector animations.

Shape Animation

You design Apple shapes as if they were going to be shown on a vector display, and Applesoft takes care of translating your vector data into the Apple raster screen image. Apple shapes can be remarkably effective if you use them correctly. You can manipulate Apple shapes more flexibly than raster, block objects. You can rotate, scale (or transform), and translate them (move them on an x and/or y axis)—all from Applesoft. Here's a simple shape-animation program that uses shape rotation; we call it THREE.TWO.ONE:

```
10 FOR I = 0 TO 5:READ T

20 POKE 768+I,T:NEXT I

30 POKE 232,0:POKE 233,3

40 HGR:POKE -16302,0

50 SCALE=50

60 FOR I = 0 TO 63

70 ROT=I

80 HCOLOR = 3:DRAW 1 AT 140,100

90 NEXT I

1000 DATA 1,0,4,0,7,0
```

Lines 10–30 initialize the shape table described in the DATA statements of line 1000. It's not a complex shape—a one-pixel vector to the left—but some of the most interesting effects involve simple shapes. Lines 40 and 50 set up the hi-res screen and set the scale of the shape to 50, enlarging our one-pixel shape to 50 pixels. The animation loop is in lines 60–90. This particular loop doesn't have an erase cycle. To add one, insert the following line:

```
85 HCOLOR =0:DRAW 1 AT 140,100.
```

Applesoft offers another method of erasing that also works with raster animation. Modify THREE.TWO.ONE so that lines 80 and 85 read 80 XDRAW 1 AT 140,100 and 85 XDRAW 1 AT

```
5 SW=40:REM Screen Width 40 or 80

10 A$(1)=";;;;;];;;;;"

20 A$(2)=";;;;;;];;;;"

30 A$(3)=";;;;]]]];;;"

40 A$(4)="];;]]]]6];;"

50 A$(5)=";]];]]]]]]"

60 A$(6)=";;]]]]]]];"

70 A$(7)=";]];;]];;;;"

80 A$(8)="];;;];;;;;;"

90 A$(9)=";;;;;;;;;;;"

100 FOR I = 1 TO 24

110 FOR J = 1 TO SW-(I=24)

120 PRINT ";";:NEXTJ:NEXT I

130 POKE 2039,187

140 H=1:V=10

150 FOR I = 1 TO 9:HTAB H:VTAB V+I

160 PRINT A$(I):NEXT I

170 FOR I = 1 TO 9:HTAB H:VTAB V+I

180 PRINT A$(9):NEXT I

190 H=H+1:IF H>SW THEN H=1

200 GOTO 150
```

Figure 1: The TEXT.ANIMATE program

140,100. The XDRAW instruction does not require a color command, as color is irrelevant. The *X* in XDRAW stands for eXclusive OR (XOR). In XOR animation, the screen pixels are inverted. Where a pixel is lit, XOR darkens it; where a pixel is dark, XOR lights it. The first XDRAW, then, draws by inverting the black screen to white, and the second XDRAW erases by inverting all the pixels in the shape to black. There's no simple way to demonstrate XOR animation with a block shape, but many commercial animation packages offer XOR as an option.

XOR animation is not without its problems. The XOR of violet is orange or green, and the XOR of green is violet or blue, depending upon whether you used a whole byte or just one pixel with the exclusive-OR drawing method. Color animation with XDRAW is difficult but possible with creative shape design. Second, XDRAW animation flickers because the erase cycle is visible. To solve this problem, you must use both graphics pages with page flipping to make the erase cycle invisible. Finally, unless you use simple backgrounds, XDRAW animation doesn't look good.

A few simple modifications to THREE.TWO.ONE will demonstrate translation, or movement, along an x and/or y axis. Delete line 70, modify line 60 to read FOR I=60 to 250, and change the XDRAW commands in lines 80 and 85 to read XDRAW 1 AT I,100. Changing the x coordinate with the FOR/NEXT loop causes the line to be translated across the screen.

By substituting the appropriate shape, you can now use this program to animate a car driving across the screen. Complex shapes are difficult to create without a shape utility, however. (See "Shaping Up" in the August and September 1984 issues of *A+*).

Tools for Animation

The program examples we've presented here are simple. To incorporate more sophisticated animations in your graphic presentations, treat yourself to a commercial animation package. These utilities allow you to create impressive animation without expertise in programming. Next month, we'll look at the latest of these packages. ✚

Roberta Schwartz and Michael Callery teach computer graphics at the New School in New York. They have collaborated on several educational software projects and are writing a book on Apple graphics for Prentice-Hall.

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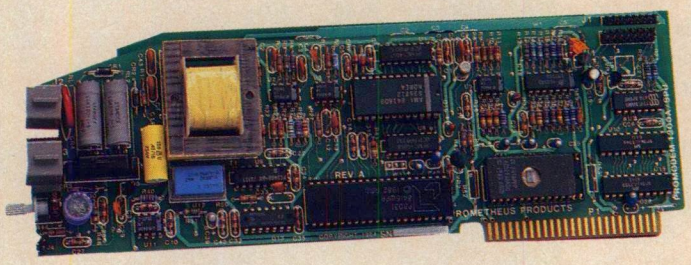

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```
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    © PROMETHEUS PRODUCTS INC.
```

```
1} COMMUNICATIONS
2} FILE TRANSFER
3} OPTIONS
            USE ESC TO EXIT
            ENTER SELECTION
```

```
1} BAUD RATE  1200  300
2} DATA BITS  8  7
3} PARITY  NONE  ODD  EVEN  MARK  SPACE
            USE ESC TO EXIT
            ENTER SELECTION
```

```
1} TYPE        XMODEM  LINE
2} DIRECTION   SEND  RECEIVE
3} FILE NAME
            USE ESC TO EXIT
            ENTER SELECTION
```

```
1} PRINTER        ON  OFF
2} CLOCK          ON  OFF
3} STATUS LINE    ON  OFF
4} KEYBOARD       ON  OFF
5} CAP LOCK       ON  OFF
6} ECHO           ON  OFF
7} LF AFTER CR    ON  OFF
            USE ESC TO EXIT
            ENTER SELECTION
```

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PART II

FIRST AID FOR DISK DRIVES

A GUIDE FOR DO-IT-YOURSELFERS

PACIFIC HORIZONS

Last month we introduced the topic of disk-drive repair by describing ways to isolate problems with the major disk-drive components. We suggested precautions and techniques for handling chips, told you how to check cables, and mentioned the chips that fail most frequently on the controller card. Now let's continue by examining problems with the DOS version and the actual disk-drive mechanism.

A common problem comes up when you use the wrong disk-operating system. The DOS tells the system hardware what kind of disk formatting and mapping to use. The older DOS version 3.2 uses a 13-sector format, and the newer version 3.3 uses a 16-sector format, which is Pascal- and ProDOS-compatible. The disk-controller card needs P5 and P6 PROMs to read DOS 3.2, 13-sector diskettes. Likewise, it

needs P5A and P6A PROMs to read DOS 3.3, 16-sector diskettes.

Some manufacturers of Apple-compatible disk-controller cards offer controllers that read both formats.

COMMON DISK-DRIVE PROBLEMS

You can remove the disk-drive cover by unscrewing the four Phillips head screws from the bottom and sliding the metal cover away from the front of the drive. The main interior components are the drive mechanism, and the analog board on the top (see figure 1).

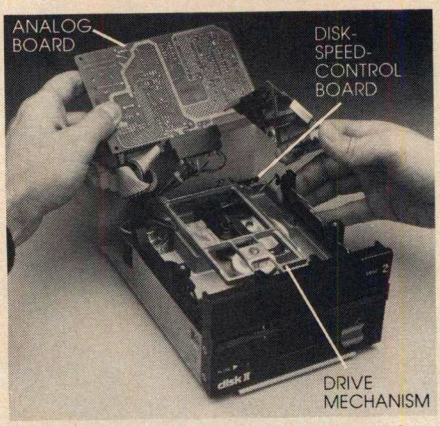
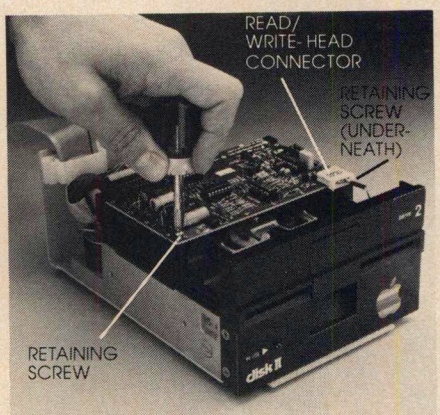
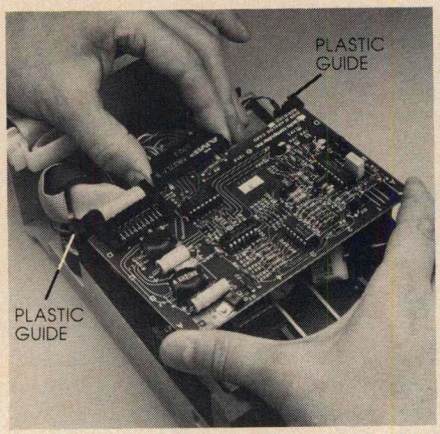


Figure 1: The main interior components of the disk drive





Figures 2 and 3: Removing the analog board: Unplug the read/write-head connector, unscrew the front retaining screws, and slide the board forward until it clears the plastic guides in the back.

Apple uses both Shugart and Alps drive mechanisms in its disk drives. The Shugart mechanism has a smooth metal casing and a long stepper-drive motor. The Alps mechanism has a dull-metal magnesium casing and a lower-profile stepper motor. Both have a disk-speed-control board and a speed-control-adjustment potentiometer on the rear of the drive mechanism.

The drive mechanism itself is mounted on the bottom cover plate with four additional screws. You don't have to remove this bottom plate unless you have a bad mechanical assembly. To remove the analog board, unplug the read/write-head connector, unscrew the front retaining screws, and slide the board forward until it clears the plastic guides in the back (see figures 2 and 3). Note the location of pin 1 on your cable and card for reference.

Burned Components

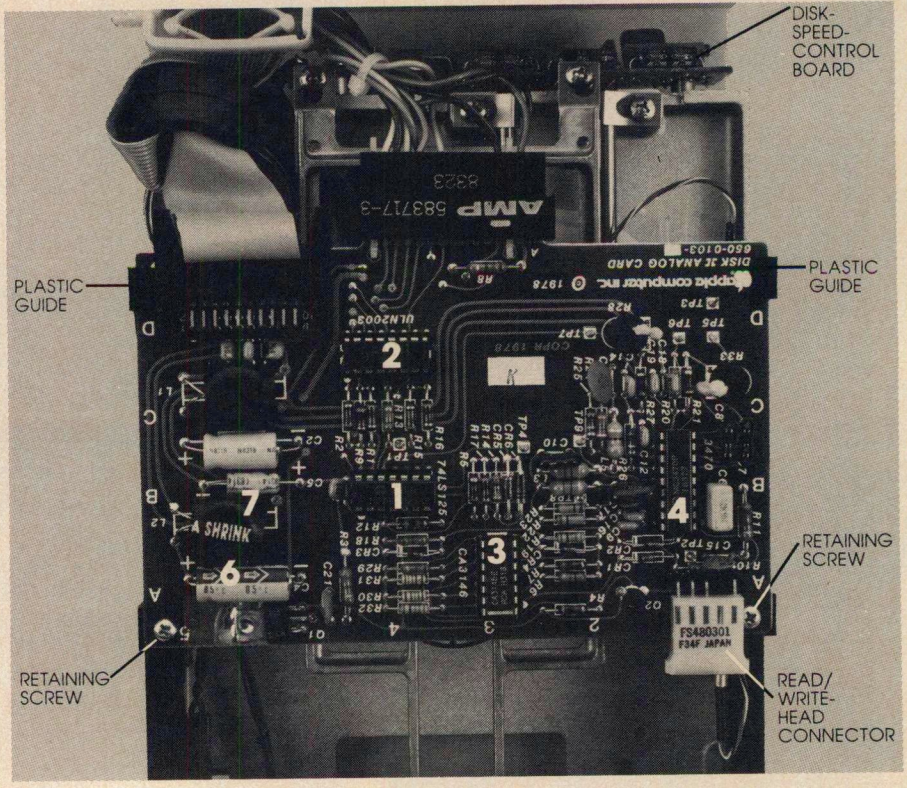
If you have smelled any smoke, you need to examine the analog card for burned components.

The parts that crack or burn most often are the 74LS125 IC and socket, the 3470 IC and socket, and the electrolytic capacitor that filters the board's voltage supply (see figure 4). If any of these components are burned, you need to replace them and possibly the entire analog card. (Most dealers will not exchange boards for you, especially if you have a burned component beyond obvious repair.)

Once you've found the bad components, replace them with parts from any Radio Shack or other electronic-parts store. Make sure you do not bend any IC pins when you replace them and that the orientation is correct (determine which end has pin 1). Replacing damaged sockets or capacitors requires soldering. Refer to the additional sources at the end of this article for soldering techniques and tips. Be careful not to damage the thin metal traces, called "runs," when replacing sockets. You can replace damaged, burned, or missing runs with fine wire, such as the wire you use for wire-wrapping. If the electrolytic capacitor needs replacing, you can use a capacitor with a higher voltage and capacitance value than the original, if you want.

Once you've replaced any burned and cracked components, carefully reconnect the cables and check to make sure that all the pin 1 contacts on the connectors and chips are oriented properly. Now turn the computer's power on and try to boot your system. As long as the lower light is on, you can proceed; otherwise, immediately turn the computer off and double-check everything. After the system has been on for a min-

*Figure 4: Analog-card components (in order of their frequency of failure): **1.** 74LSL25 (the drive-control circuit) **2.** ULN2003 (stepper-motor drivers) **3.** 3146 (write/erase transistor array) **4.** 3470 (read and bias amplifier) **5.** IC sockets (holds integrated/circuit chip, underneath number 1, 2, 3 and 4) **6.** C4 (filter capacitor) **7.** C5 (filter capacitor)*



▶ CASE STUDY

The following is an example of a common situation involving an inoperative disk drive.

Symptom

After moving and reconnecting his computer system, a user found that his disk drive was completely inoperative. He heard a "pop" just after turning on the computer and noticed a "burned smell."

Analysis

The user isolated the problem by a process of elimination and substitution. He installed the controller card in another computer, and it operated normally with the other computer's disk drive. Next, he removed the drive cover and examined the analog board. The large chip (MC3470) at B1 was blistered and cracked, and there was a smoke stain on the roof of the cover. This chip was the read amplifier, one of the most expensive chips in the disk drive at nearly $4.95.

Cure

The solution is to replace the MC3470 chip and check if the disk drive works correctly. Although the actual cause of the problem will never be known, a probable factor was incorrect connection of the 20-pin flat cable to the disk-controller card. A careful examination of the cable connection to the disk-controller card might have revealed an improper connection.

The moral is to check carefully before unplugging anything! If the cable is connected just one row of pins off, +12 and −12 volts are applied to circuits in the Disk II Drive that can withstand +5 volts, so chips and other parts get damaged. Rarely will the controller card be damaged; however, be careful when connecting or reconnecting your equipment.

Adapted from Apple Chips: Troubleshooting Guide for Apple II & II Plus Computers *by Richard Peschke and Mason Friar, from Apple-Dayton, Inc., Box 1666, Fairborn, OH 45324.*

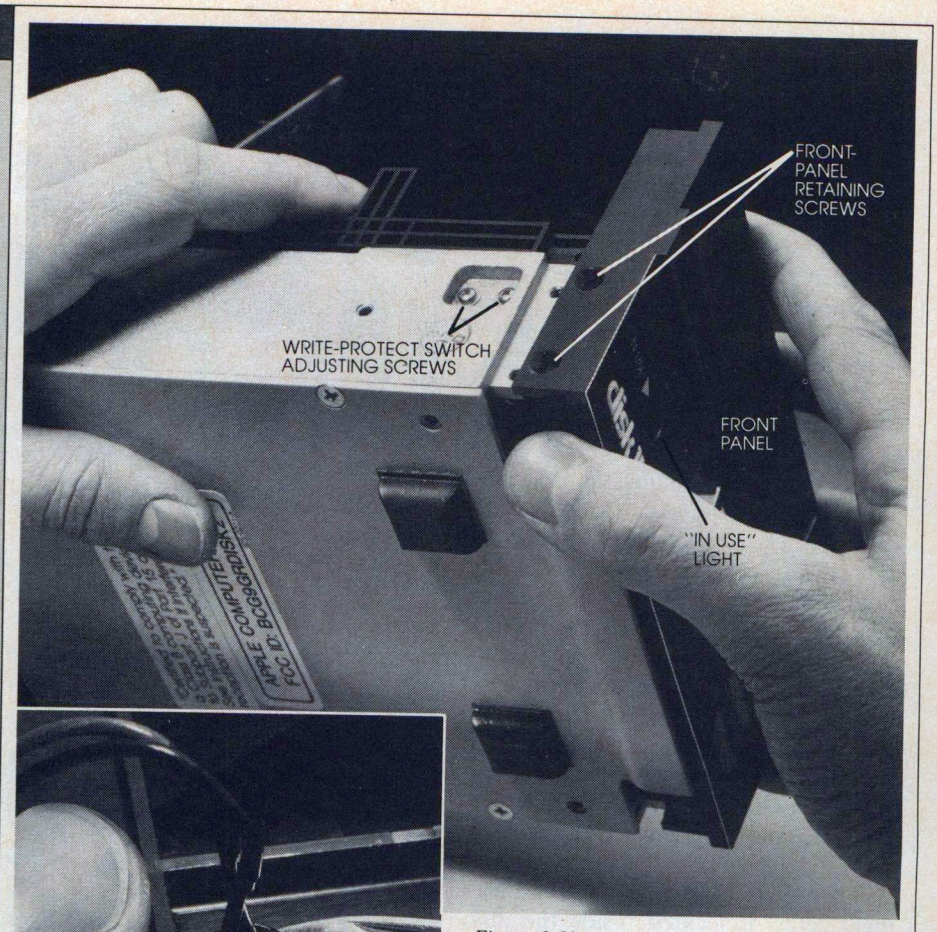


Figure 6: You can correct the position of the write-protect switch by adjusting the screws that hold it in place. When removing the front panel, make sure you disconnect the IN USE light first.

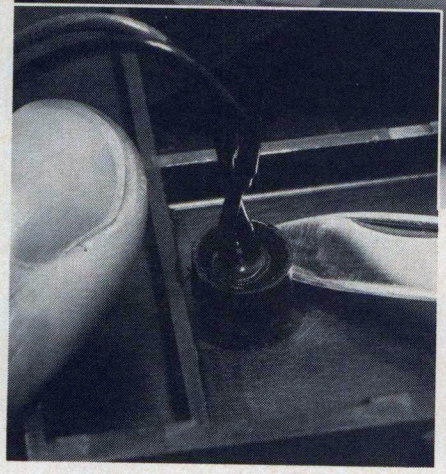


Figure 5: Removing IN USE light: To remove the front panel, you must disconnect the IN USE light by prying off the retaining ring. Then, from the front of the panel, gently push the light through the socket.

ute or two, you can check the disk-controller board and the analog board for additional burned components by lightly touching the chips. If you find any chips that are too hot to touch, you'll know you have a problem with that chip and must replace it.

Replacing Analog-Card Parts

Although hot, damaged chips usually need replacement, other problems on the analog card can cause chips to overheat. You can correct the most common problems with the analog card by replacing the following components, in order of their frequency of failure. You can purchase most of these parts from an electronics store such as Radio Shack:

1. 74LS125 (the drive-control circuit)
2. ULN2003 (stepper-motor drivers)
3. CA3146 (write/erase transistor array)
4. MC3470 (read and bias amplifier)
5. IC socket (usually one where an IC has burned out)
6. Filter capacitor C4
7. Filter capacitor C5

Troubleshooting the Disk Drive

The best way to localize a problem quickly is by substituting a good analog board, a drive mechanism, a disk-speed-control board, and/or a write-protect switch. As long as you've replaced the burned components on your controller card and analog board, you can safely substitute assemblies from a good disk drive until you find the defective assembly.

Exchanging the entire mechanical assembly is often faster and easier than repairing it.

If you decide to replace the mechanical assembly, you will have to remove the front panel of the drive if you want to keep the same faceplate. To remove the front panel, you must disconnect the IN USE light by prying off the retaining ring (see figure 5). Then, from the front of the panel, gently push the light through the socket. Finally, unscrew the retaining screws on each side of the front panel (see figure 6).

Mechanical Adjustments

The most common adjustments the mechanical assembly requires involve the speed control, the write-protect switch, and radial alignment.

To correct the radial alignment, you need a special alignment disk and an oscilloscope, which is beyond the scope of this article. You can determine whether the radical alignment is cor-

rect or not by using a diagnostic program, though.

The write-protect switch must be in the path of a disk inserted into the disk drive. You can correct the position of the switch by adjusting the screws that hold it in place (see figure 6).

Speed Control

Speed control is the most common adjustment your disk drive may require. You will need a speed-diagnostic program, such as Locksmith, AP Test, or Disk II Test, to display your disk-drive speed and assist you in adjusting the speed of your drive. Several other commercial speed-diagnostic programs are available, from such firms as Nikrom, Dymek, and Verbatim. Speed-diagnostic disks may also be available from users' groups. Follow the manufacturers' instructions for their disk-speed diagnostics. For all Apple speed diagnostics, you'll need an extra disk that is not write-protected. Do not use your good DOS backup disk, though. If your disk is not write-protected, but you get a write-protect error when trying the test, you may have a bad analog card.

The Apple disk-drive speed-adjustment screw is located inside the disk drive, which means you'll have to remove the drive cover. Use a very small, flat screwdriver to adjust the speed (see figure 7).

Some newer drives such as the Micro-Sci Model A2 have a speed control that you can get at without removing the drive cover.

Common Mechanical Problems

Here are the obvious mechanical problems to look for:

1. Hub-ring collet—This ring may not clamp down securely on the diskette. Look for a weak clamping action due to a defective spring or door arm. To replace the hub-ring collet or spring, remove the C ring, using a screwdriver and needle-nose pliers (see figures 8 and 9).
2. Head pressure pad—The pad may be crooked, worn out, or dirty, causing speed variations or scratching of the diskette. Use caution when checking the pressure pad, since you can damage the head load arm if you pull it up and back. The pressure pad is easy to replace by squeezing the clip and pulling the head load pad out of its holder. Then press a new pad into place, making sure it snaps securely into position (see figure 10).
3. Write-protect switch—A bad drive often causes write-protect errors. The write-protect switch is hardly ever the

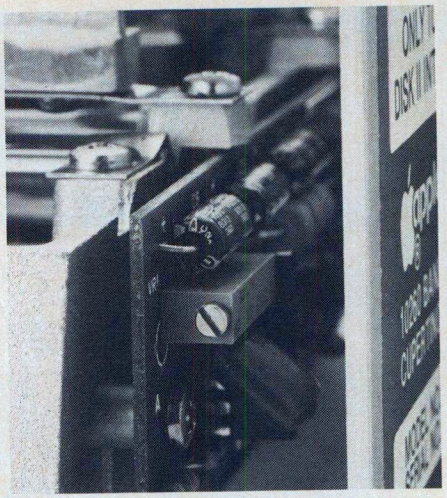


Figure 7: The disk-drive speed-adjustment screw is located inside the disk drive on the right side, in the rear. Using a speed-diagnostic program to display the speed of your drive, adjust the screw until the speed of the drive is within tolerance.

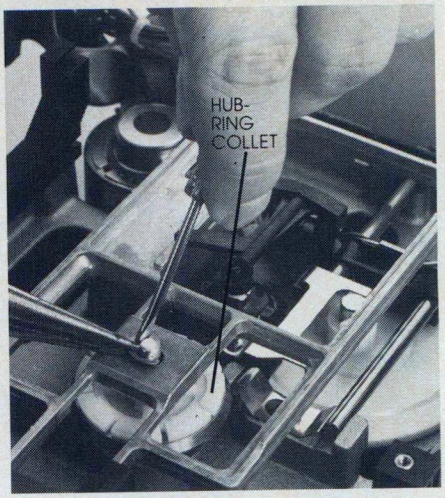


Figure 8: To replace the hub-ring collet or spring, remove the C ring, using a screwdriver and needle-nose pliers.

Figure 9: The hub-ring collet clamps the diskette down when the disk-drive door is closed. If the ring does not clamp down securely, look for a weak clamping action due to a defective spring.

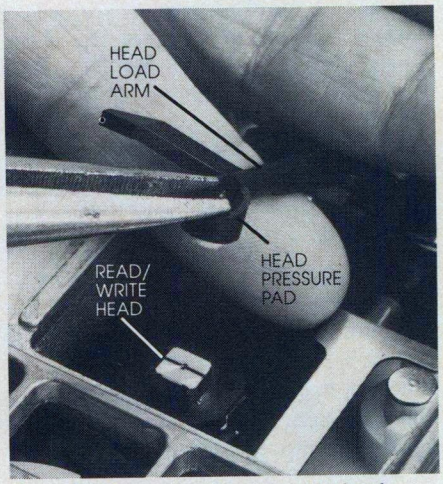


Figure 10: You can easily replace the head-pressure pad by squeezing the clip and pulling the head-load pad out of its holder.

▸ PREVENTIVE MAINTENANCE

Preventive maintenance for disk drives divides into four main areas: cleaning the controller card and integrated-circuit chip contacts, cleaning the read/write head, checking and possibly replacing the head pressure pad, and checking and possibly adjusting the disk-drive's speed.

Contact Cleaning

The contacts on the disk-drive controller card often become oxidized or build up an insulating layer of film, causing a poor connection and requiring contact cleaning. Contamination may also appear on the thin leads on the integrated-circuit chips.

To clean the controller card, burnish each contact gently, using a soft, nonabrasive eraser, rubbing lengthwise along the contacts or "piano keys." Remove any eraser residue with denatured alcohol. You can use the same technique for chips, cleaning each lead, one by one.

Cleaning the Read/Write Head

Commercial head-cleaning kits are available. One alternative is simply to use a *foam* swab (available from Radio Shack) and denatured alcohol. Following the procedures we covered earlier in the article, disassemble the disk drive and lift the analog board to gain access to the read/write head and the pressure pad. Gently swab the head, rubbing from front to back. Make sure the head is dry before the pressure pad touches the head again. Check the load pad and replace it if necessary, as explained earlier (see figure 10).

Disk-Drive Speed Adjustment

See the Speed Control section on this page.

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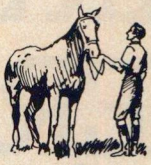

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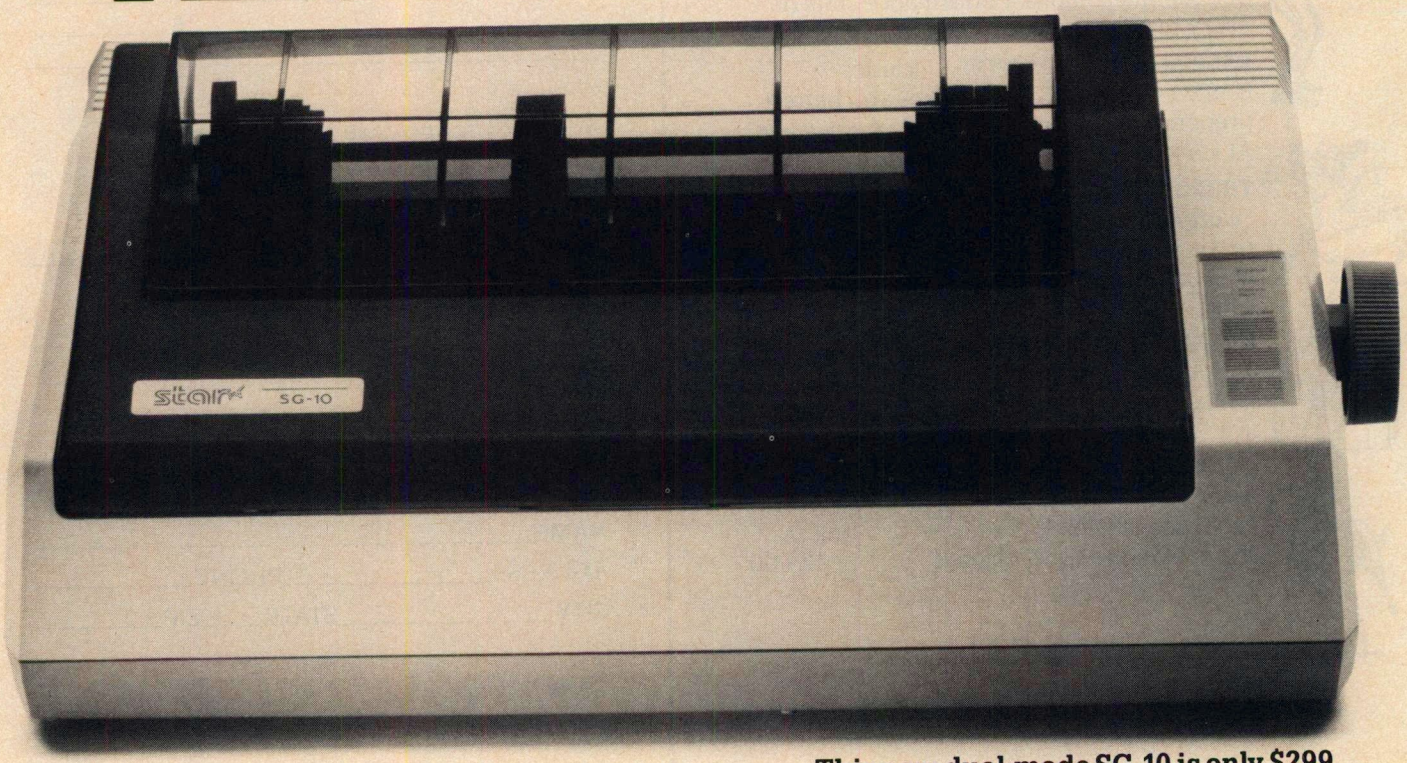

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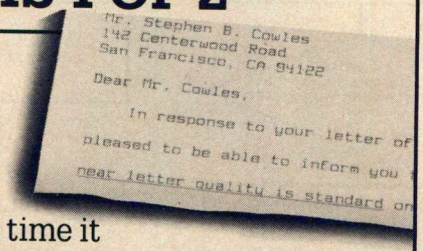

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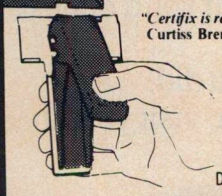

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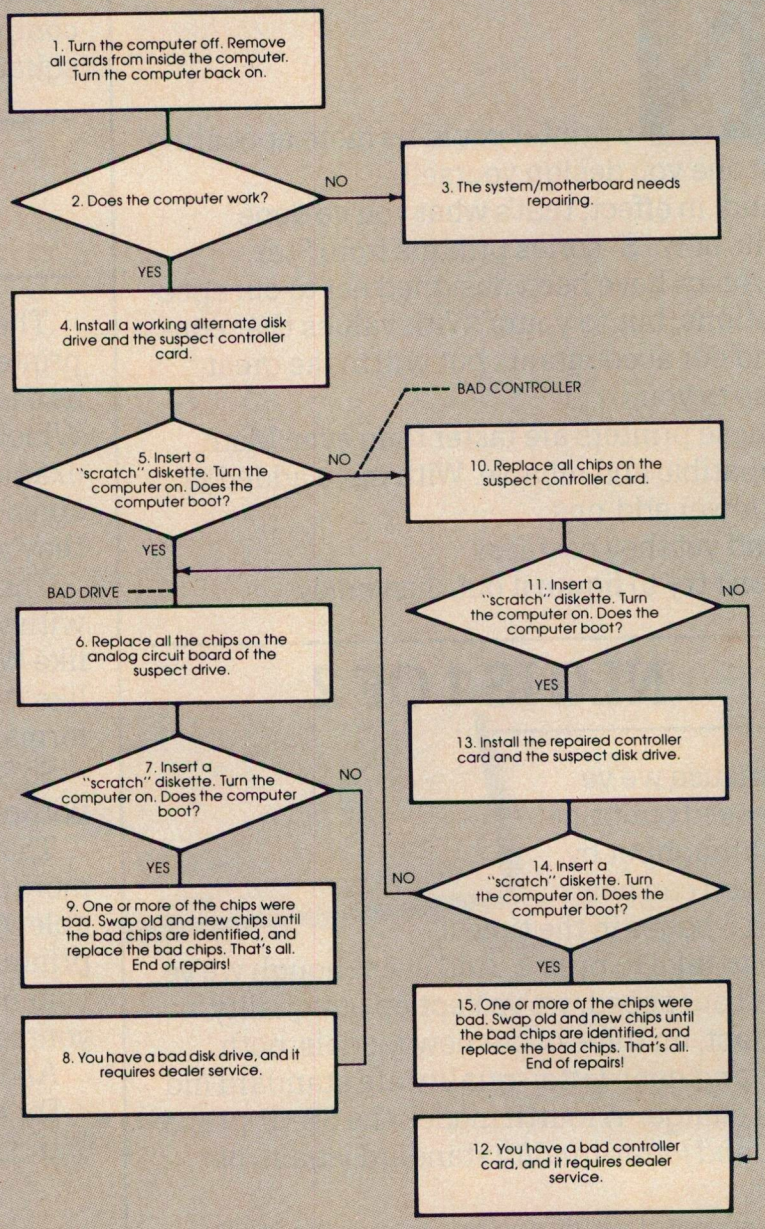

SOURCE: APPLE DAYTON'S CHIP KIT MANUAL

culprit, though. If you suspect the switch, make sure you hear a click when you insert your test diskette. Use an ohmmeter to check whether the switch is working or not.

Do not use lubricants! The drive contains nothing that needs lubricating at all. The motors and spindle shaft are lubricated in the factory, and, unless the drive is completely disassembled, the lubrication points are inaccessible.

Drive Noise

Most drive noise is a result of the mechanical structure of the drive and the action of the motor. It does not necessarily mean that the drive mechanism is bad.

Dive In

Now, gather together all the tools that you will need, roll up your sleeves, and take a deep breath. Good luck in all of your drive-doctoring efforts! ✚

Michael Nadelman is president and founder of Apex Information Systems, a microcomputer service/specialty company, and has worked with computers at the component level since 1966. Chip Carman has six years' experience with Apple computers. He does consulting for various insurance companies, doctors, and retail outlets throughout California and develops and customizes software.

▶ PRODUCT INFORMATION

HARDWARE

Disk II Kit, Apple II/II Plus Mother board Chip Kit, Combination Mother-board and Disk II
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Locksmith Version 5.0, rev. F
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The Plain English Repair and Maintenance Guide for Home Computers
By Henry F. Beechhold
Simon & Schuster, Inc.
Rockefeller Center
1230 Avenue of the Americas
New York, NY 10020
(212) 245-6400
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The Apple II Circuit Description
By W. D. Gayler
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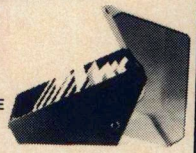

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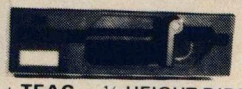

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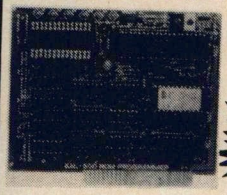

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If you have an Apple II, Apple II Plus, or Apple IIe, we have good news for you. Now there are two inexpensive software programs that can turn your Apple into a much more valuable tool.

Softerm 1 connects you with information services.
Softerm 1 lets you retrieve information from services such as *The Source,*℠ *CompuServe*®, and *Dow Jones News/Retrieval*®. Plus, gives you the ability to access bulletin boards and send or receive electronic mail. Other features include user-defined keyboard macros, built-in phone book for automatic dialing, terminal mode line capture simultaneously to print or disk, copy screen to print or disk, and terminal status display.

Softerm 2 connects you with your company's computer.
This expanded version of Softerm lets you gain access to the information stored in your company's main computer from your home or office. With either version of Softerm, you can down load information into your Apple and capture it on your own disk in any format you choose—DOS, CP/M®, or Pascal. Also included with Softerm is a source program for your host computer to ensure compatibility with Softerm's file transfer capabilities.

Makes your Apple work exactly like any major terminal.
Softerm 2 provides complete emulation of these terminals: ADDS Regent 20, 25, 40, 60; ADDS Viewpoint; Data General D200; Datapoint 3601; DEC VT102, VT52; Hazeltine 1400, 1410, 1500, 1520; Hewlett-Packard 2622A; Honeywell VIP7205; VIP7801, VIP7803; IBM 3101 Model 10 and 20; Lear Siegler ADM-3A, ADM-5 and TeleVideo 910, 925, 950. And the list is growing all the time. We'll send you a User's Guide, handy reference card, and a telephone number to call if you need more assistance.

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▶ BY CHIP CARMAN

APPLE III SOFTWARE update

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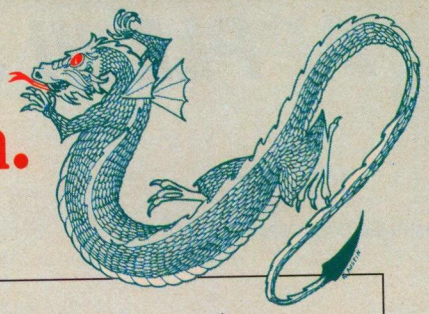
An estimated 80,000 Apple III computers are being used by businesses every day, and the owners of these IIIs are adamant in their praise of the Apple III as one of the best business machines around.

In order to keep Apple III owners up to date, we are publishing a three-part list of software currently available for the Apple III.

Big Game Hunting? Try Baggin' Our Dragon.



It's the biggest game in town

Our dragon, of course, is Wizardry—that unique series of computer recreation programs designed for Apple users who are seeking the ultimate "big game" challenge.

Since its debut, Wizardry has been the best-selling computer game of its kind.

For a very good reason:

Because Wizardry is more than just a game, more than a diabolically clever maze.

Wizardry is a complex world of variety and depth. A world of richness and pleasure.

Packed with suspense, full of surprises, Wizardry is enchanting—a compelling diversion that turns your leisure time into prime time.

Wizardry is powerful and sophisticated. A simple command system, 3D maze displays and superb programming provide you with month after month of involvement and satisfaction.

Four years old and still growing, the game is already recognized by critics and game lovers as a classic.

Simply stated, Wizardry is the finest fantasy role-playing computer game you can buy.

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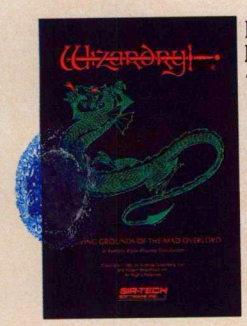
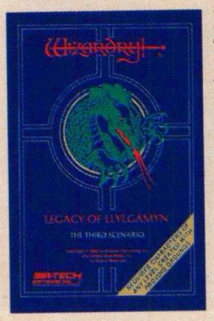


Proving Grounds of the Mad Overlord

The First Scenario

Unlike any other game you have ever played. A fascinating 10-level maze full of monsters, sorcery, traps and treasures. As you gain skills, the characters you create grow stronger, richer, wiser and better able to survive. The final goal is elusive. Your experience . . . unforgettable.

Twice voted "All Time Most Popular Computer Program" —Softalk Readers

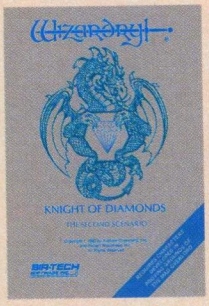


Legacy of Llylgamyn

The Third Scenario

A spellbinder that advances the classic traditions of Wizardry. Find the great dragon L'kbreth and save the people of Llylgamyn. Includes full screen maze display and Windo-Wizardry, the revolutionary pop-up window graphics system. Requires brave adventurers of any level developed in PROVING GROUNDS.

". . . A Landmark in Graphics Advancement" and "The Best Yet" —Softalk

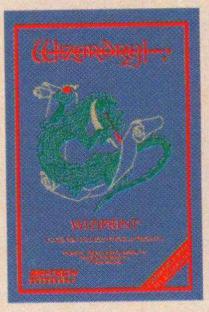


Knight of Diamonds

The Second Scenario

This classic journey should only be attempted with those Wizardry heroes who have attained the 13th level of ability in PROVING GROUNDS. Their challenge—and yours—to adventure through a six-level maze and become the Knight of Diamonds. First-rate fantasy!

Awarded "Best Adventure Game for the Home Computer"
—Game Mfrs. Association of America



Wiziprint

Character Statistics Printout

A helpful utility program that prints the possessions, attributes and known spells of all your Wizardry characters. Quick, neat and easy-to-read. For use with 80-column printers. Compatible with all Wizardry scenarios. A real timesaver!

"Wiziprint is a very handy utility disk for ardent Wizardry players"
—Roe R. Adams III, Softalk

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PQ: THE PARTY QUIZ GAME
ROBOT ODYSSEY I
MIND PROBER
SUNDOG: FROZEN LEGACY
RENDEZVOUS WITH RAMA

THAT'S entertainment

Where the granddaddy of them all, Trivial Pursuit, can often turn into an all-evening affair, PQ is fast—and I mean *fast*.

RAPID-FIRE TRIVIA

As 1985 rolls along, it's becoming more and more evident that trivia games are here to stay—at least for another year or so. The second year of the craze has brought heightened competition to the trivia-game marketplace. No longer is it enough merely to have a lot of obscure questions covering a variety of arcane subjects. Now—as what character said in what famous movie musical?—"you've gotta have a gimmick."

PQ: The Party Quiz Game does. Many games have chosen specialization as their gimmick—whole sets of questions dedicated to America's space effort or ancient Etruscan sports—but PQ's unique feature is its approach to the mechanics of the question-and-answer process.

The package boasts that PQ "frees players from computer keyboard captivity." The game comes with four four-button, hand-held controllers that you can easily connect to any Apple II system. The number of controllers limits PQ sessions to a maximum of four players. Another option is to have two teams of two players each.

Where the granddaddy of them all, Trivial Pursuit, can often turn into an all-evening affair, with players mulling over each question for minutes (or even hours), PQ is fast—and I mean *fast*. The game's response-time option lists only four choices: three seconds, four seconds, five seconds, or ten seconds.

Other options are number of rounds: 5, 8, 12, 16, or 20; competitive or social: only the first correct response counts, or all correct responses are worth points; and handicapping, which cuts in half the amount of time a certain player has to answer.

Once you've dealt with these options, the game begins. PQ's questions are posed in a multiple-choice format; for example: What is the commonest sur-

name in the world:
1) Smith
2) Chang
3) Jones
4) Rogers

Players quickly press the number of the correct response (2—surely you didn't fall for Jones or Smith) on their controllers and are rewarded with noises, points, and the continuance of the game. The action is fast and furious, and therein lies the game's charm—or flaw, depending on your point of view.

If the excitement of rapid-fire questioning appeals to you, PQ is your game. If one of your favorite aspects of trivia gaming is the leisurely discussion time between questions, however, you may find PQ somewhat daunting—and if you are a slow reader, forget it!

Players with any sort of vision problem comprise another group that might easily find PQ tough going. The questions' display font is rather broad and can be hard to read, especially quickly. A perfect example of this from play was when I thought I saw the true/false statement "Male horses have no teeth." What a ridiculous question, I thought to myself; *all* horses have teeth. Clearly the answer was *false*. When the computer indicated that my response was wrong, I was incredulous—until I examined the screen a little more closely and realized that the operative phrase was *40 teeth*.

Still, if you or any of your friends spent a significant portion of your youth watching "Jeopardy" and dreaming of actually participating, PQ may be the closest thing around to fulfillment of that dream.

Anne Kaplan-Neher

PQ: The Party Quiz Game
Suncom
260 Holbrook Drive
Wheeling, IL 60090
(800) 323-8341
List Price: $74.95
Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive
CIRCLE READER SERVICE NO. **622**

ROBOTS IN A MAZE

In Robot Odyssey I, The Learning Company has produced an educational tool that introduces users to circuit and chip programming. The program doubles as an adventure game, using players' designs to navigate robots through a five-leveled maze.

First you "outfit" your robots for special tasks such as crawling over walls, picking up objects such as keys, relaying messages to other robots, traveling in preprogrammed directions, and even dancing to music. You must solve several problems en route to the maze's exit, with the help of a variety of clues. The entire adventure may take several days to conclude.

Actually, this program exhibits two distinct functions: a robot-construction set, in which you learn robot design by manipulating components on the screen, and a challenging adventure game that uses the logical concepts you have mastered prior to play.

The software package comes with a 48-page illustrated booklet equipped with design hints; a quick-

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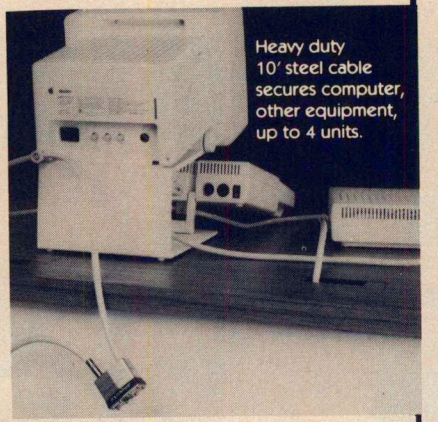

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CIRCLE 203 ON READER SERVICE CARD

reference section that includes a glossary of terms, spec sheets, and other items

> I had fun entering a robot's body.

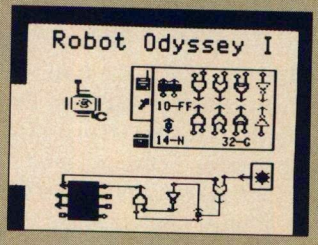
of interest; and more. The manual's text is easy to understand and illustrated with many cartoons to help lay people relax with this not-so-simple topic.

I had fun directing the cursor over the screen, entering a robot's body, fiddling with my toolkit, and forming circuits of greater and greater complexity. One feature allowed me to set up a sample maze to test a robot's function. I found I could debug a wrongheaded robot or enhance and build upon a successful model. In fact, I could experiment to my heart's content! In the course of the game, creativity and flexibility were the most rewarding keys to success.

Nothing's perfect, of course. The size of the screen figures do not conform to scale. For example, the cursor almost matches a robot's size, but once you're inside the mechanism's interior, the dimensions magically expand. Another example: Moving inside a robot's eye produces a "bird's eye" view of the robot and surroundings, which counters reality, since activating a robot's eye from within should not result in seeing one's own mechanical self from above. These distractions are only minor, however.

Younger players may require extra patience and the ability to follow directions in the initial tutorial stages; you must master the various sequences of robot design to handle the later game. Users who enjoy learning and logic and who can adhere to serious, painstaking detail should benefit the most from Robot Odyssey I.

The mode of play in the game section of the disk is basically in an adventure



format, since you must collect items to aid you in your quest, encounter changing scenery, and solve different dilemmas. 'Tain't easy! Only hearty, alert, and intelligent persons need apply.

The graphics are colorful, the sound lively, and the animation fast-paced. You have the option of using a joystick, keyboard, or mouse. You can save and restore a game if you have access to a second disk.

Players 13 years or older who relish exercising their gray matter and who enjoy absorbing, lengthy adventure games should appreciate this software package.

John DiPrete

Robot Odyssey I
The Learning Company
545 Middlefield Road
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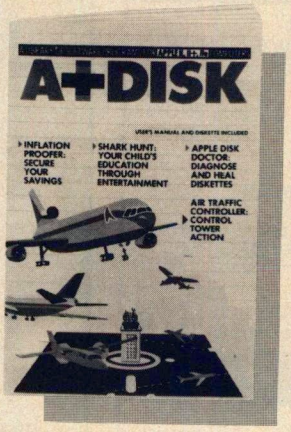

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CIRCLE 244 ON READER SERVICE CARD

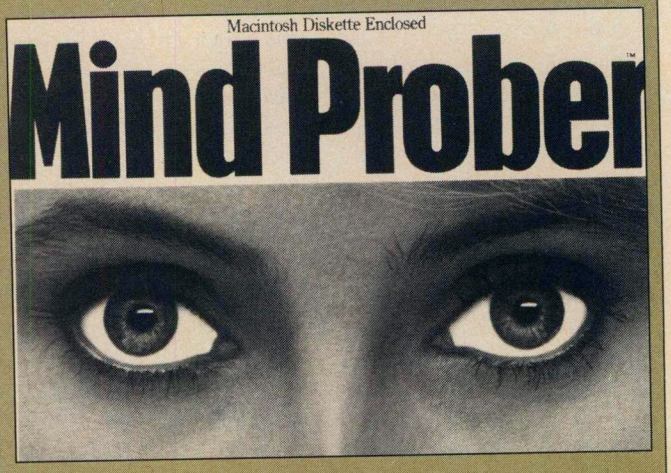
PARLOR PSYCHOLOGY

Mind Prober is a fascinating program that I found enjoyable, as long as my friends and I did not take its conclusions too seriously.

It is fascinating because it claims to reveal the hidden thoughts of friends and associates. It asks simple questions and then draws some complex and far-reaching conclusions about the subject's personality. The Mind Prober report tells you how the subject deals with relationships, stress, sex (if over 18), and school (if under 18) and then sums it all up with a few sentences on what makes the subject tick.

It is ridiculously easy to use. Simply start the program and begin responding to a list of 79 words, such as *conservative*, *religious*, or *sincere*. Your task is to agree or disagree that each term describes the person in question. You may not be quite sure what *conservative* means in the context of the program, and you'll often wish you could rank your subject on a scale of 1 to 10. The words *agree* or *disagree* don't always give you enough sliding room. If you're confused about the meaning of a word, a helpful appendix to the documentation defines them for you. If you see all sorts of gray areas between *agree* and *disagree*, that's tough. You must choose one or the other.

That's it. Once you've reacted to all the words, you get a brief description (usually about 15 to 20 sentences) of the person. The descriptions don't mince words. I ran the Mind Prober on a dozen friends and associates and then showed them the results. I found that the subjects often felt that most of the conclusions were correct. In fact, sometimes the assessment seemed so perceptive that it was frightening—frightening that a program could make such sweeping (and accurate) judgments with nothing but a relatively few descriptive adjectives. At other times, however, the assessments seemed so far afield that they were laughable.



Mind Prober's manufacturer is promoting the product as a serious program. A

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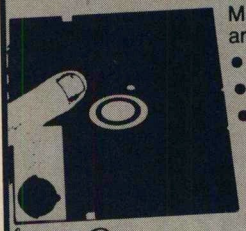

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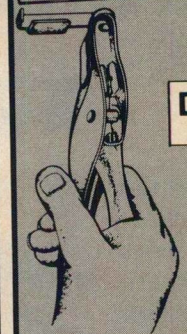

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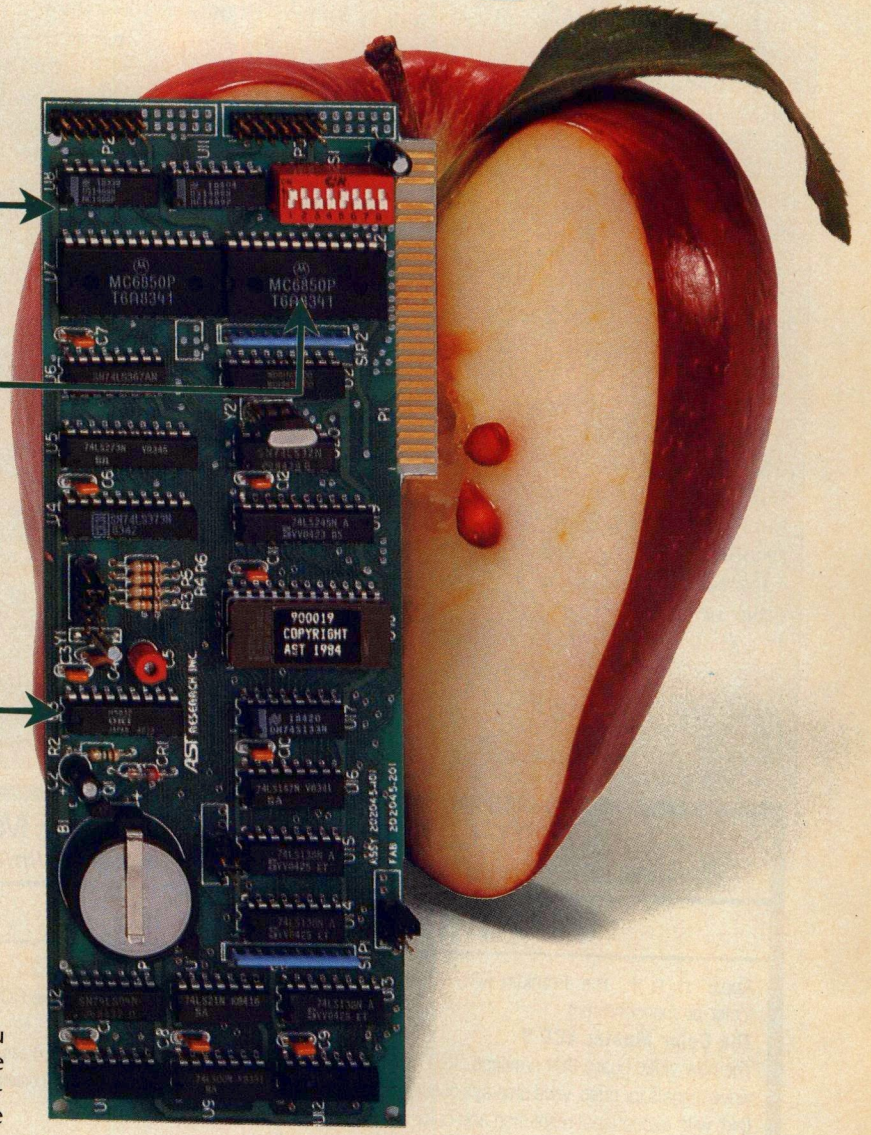

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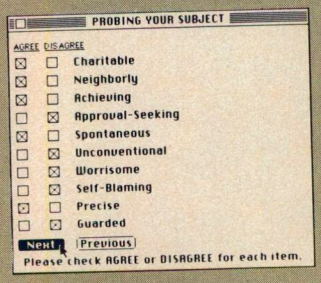
CIRCLE 323 ON READER SERVICE CARD

blurb on the back of the Mind Prober manual reads, "In less than 20 minutes you can find out everything about how a particular person thinks . . . what their strengths and weaknesses are . . . the kinds of relationships they form . . . their sensitivity to stress . . . and their sexual interests. You can scientifically find out who they are and where they're coming from."

The manual suggests that you use Mind Prober to help you "prepare for a sales call or an important interview" and goes on to recommend its use before contract negotiations or other important meetings. In a personal setting, it is supposed to provide insights "into the motives and behaviors of your family and friends." The documentation claims that "now you can accurately assess someone you've known for only five minutes."

I've never been able to develop the knack of knowing whether or not a person is conservative, liberal, caring, warm, competitive, charitable, distant, educated, cultured, hard-working, idealistic, loyal, sarcastic,



joking, kind, independent, passive, playful, precise, responsible, or sincere—to mention just a few attributes—in five minutes. In fact, I had difficulty making those kinds of judgments about people I had known and worked with for five years—but then, maybe I hadn't studied the manual long enough.

Perhaps if I really probed those 88 pages devoted to suggestions on "reading others," I could accurately know all these things about a person I had known for just five minutes.

Mind Prober is subject to the oldest rule of computing: garbage in, garbage out. What you seem to be getting is a generalized reflection on how *you perceive* your subject. Thus, Mind Prober showed me to be quite a different person in the eyes of my wife than I was in the eyes of my coworkers, and the least flattering assessment of all came from myself.

The manual—written by James H. Johnson, Ph.D.; Kathy N. Johnson, Ph.D.; and Richard Gallagher, M.D.—includes a bibliography of works used to produce Mind Prober. Of the 72 papers from various professional journals, all were either authored or coauthored by J.H. Johnson, and of the five books, three were coauthored by J.H. Johnson.

> Mind Prober is supposed to provide insights.

When I showed the program to a professional psychologist, she pointed out that it was similar to testing tools that she used for diagnosing individuals. She insists on a battery of sophisticated tests, however, rather than relying on a sin-

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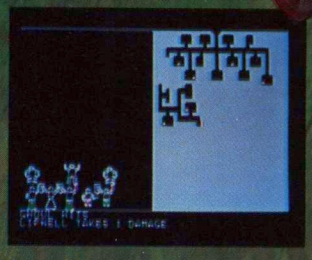

One of your comrades is injured by Ghouls during a search of the dungeons.

A sample composition of your party showing race, class and status.

CIRCLE 433 ON READER SERVICE CARD

gle one. Finally, she combines the testing information with her own observations of individuals, observations that are based

> Conclusions can be pretty unflattering.

on years of training and professional experience.

With those cautions in mind, I found myself using Mind Prober—and enjoying it—as a parlor game. Used in the spirit of friendship and fun, it seems reasonably harmless, but its conclusions can be pretty direct and unflattering.

I do wonder how a person with serious problems would react to an unflattering Mind Prober test. Because the test results come from a computer, an aura of unfailing accuracy and mystery accompanies them. What's more, two of the people associated with the program hold doctoral degrees in psychology, and a third is a medical doctor. The combination of computer "expertise" and the academic credentials behind the development of the program make the Mind Prober reports appear like pronouncements from on high.

I'll leave the evaluation of the program's usefulness to the common sense judgment of its users and the assessments of professional psychologists. As for me, my money stays in my pocket. After all, in three separate assessments of me, the Mind Prober failed to report a key trait. It never once described me as skeptical, but I am.

Greg Stone

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trading—and show a profit, too. You're going to have to learn star-ship maintenance and repair, as well as how to manage finances, weaponry, medical supplies, food stores, fuel supplies, your personal safety, and your health. You will also have to learn how to pilot a star ship, both sublight and warp-drive. (Your uncle forgot to leave you the instructions.) Meanwhile, muggers inhabit the cities, and pirates roam the skies. A word of caution: Try not to get too attached to your character—you'll probably kill him off a few times before you get the hang of surviving.

Fortunately, Sundog is easy to learn. Almost everything is done with graphics, and the graphics are good—attractive and easy to understand. The game is played entirely with the joystick controls; you'll need a joystick with two buttons. Depending on

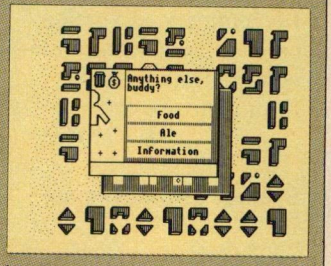
> You can go to work immediately to locate the cryogenically frozen colonists.

where you are in the game, one button is for manipulating objects, picking things up, buying them, putting them away, moving yourself or your car around, and so on. The other button is for backing up or for checking your personal status.

It may take a while to learn all the different parts of the game, but you learn as you play, because Sundog prompts you appropriately at every decision. You can go to work immediately to locate the cryogenically frozen colonists (they're stored in warehouses all over the Drayhew Region—twelve planets and eighteen cities), load them into your pod, drive your pod back to your star ship, pilot your star ship to Jondd (remember, you'll also have to buy fuel, pay for repairs and supplies, and make sure you have the weapons to fight off pirates and muggers), and finally deliver the frozen passengers to the lost colony on Jondd—which you'll first have to find.

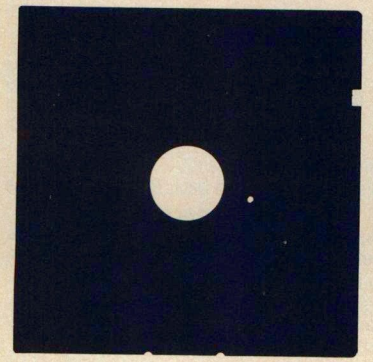
A Definite Challenge

In other words, you must solve many problems—and therein lies the challenge. Sundog: Frozen Legacy demands total concentration and involvement. If you like games on an epic scale that require a large investment of time and energy, Sundog will certainly keep you entertained for days. If you are more casual about your game playing, however, preferring games you can walk away from and forget about, this game is not for you. Because of Sundog's scope and details, it demands to be played methodically, so you may



become impatient with it rather quickly.

The game includes its own save-game feature, and side 2 of the disk has an



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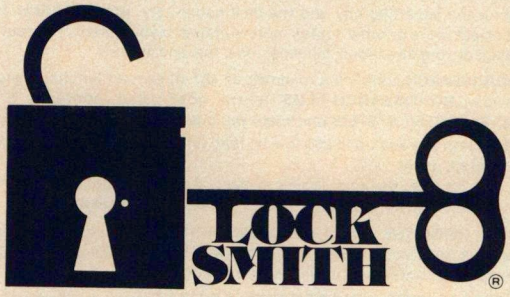

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easy-to-use set of utilities that allow you to start a new game or create a new character. You can have up to eight games in progress at any given time.

Overall, Sundog: Frozen Legacy is a well-constructed adventure game that takes full advantage of the high-resolution-graphics capabilities of Apple computers. Because it requires a genuine commitment on the part of the players, however, I recommended Sundog only for those who can invest the time to see it through to the end.

David Gerrold

Sundog: Frozen Legacy
FTL Games
7907 Ostrow
Suite F
San Diego, CA 92111
(619) 279-5711
List Price: $39.95

Requires: Apple II, II Plus, IIe, or IIc; 48K RAM; one disk drive; two-button joystick

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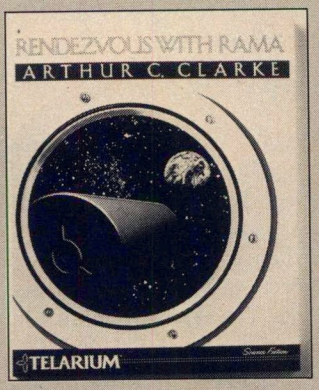
In 1973, Arthur C. Clarke's stunning science-fiction novel *Rendezvous with Rama* captured both the Hugo and the Nebula awards, the two highest honors in the field. The book was a stunning adventure—as dazzling to the mind as the movie *2001: A Space Odyssey* was to the eye.

Now Trillium Software—a new company started by Baen Books, which is primarily a science-fiction publisher—has turned Clarke's novel into a graphic adventure game. (Other Trillium games include adaptations of Ray Bradbury's *Fahrenheit 451*, Robert A. Heinlein's *Starman Jones*, and Roger Zelazny's *Nine Princes in Amber*, as well as games based on works by Michael Crichton, Alan Dean Foster, Byron Preiss, and Michael Reaves.)



As in Clarke's novel, Rama is a gigantic alien spaceship—50 kilometers (31 miles) long—that is passing through our solar system. The *Endeavor*, the only earth ship close enough to match trajectories with it, is immediately dispatched. The crew docks with Rama and enters . . . to discover that Rama is a giant hollow cylinder—something like Gerard O'Neill's proposed L-5 habitats, with star-drive engines attached. At first, Rama seems to be deserted, but as the mission progresses, strange things be-

> Rendezvous with Rama has the most stunning artwork.

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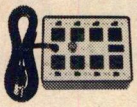

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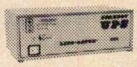

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CIRCLE 403 ON READER SERVICE CARD

gin to happen. It seems as though Rama's crew is waking up . . .

The game comes in a handsome package—as all the Trillium games do—but Rendezvous with Rama has the most stunning artwork of them all. The cover of the folder shows Rama approaching the planet Earth. When you open the folder, you see Rama from the bridge of the *Endeavor*. Open the folder again, and you are looking at a panoramic four-panel spread that shows the vast interior of Rama—her cities, her fields, her great circular river, and her gigantic engines. It's breathtaking.

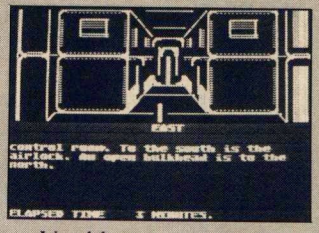
But what about the game . . . ?

The Trillium games are supposed to be adventure games with pictures—except at certain points they become arcade-style video games. Indeed, that may be their biggest problem. The

> Unable to get past the meteors, I could go no further in the game.

combination just does not work.

You start out as the captain of the spaceship *Endeavor*. You can find the bridge of your ship in your first three moves, but as soon as you get there, you are told by your technical sergeant that you will have to land the ship on Rama. You therefore type LAND, and the game tells you to insert disk B in the drive. There is no disk B; there are two disks with sides labeled 1, 2, 3, and 4. Assuming they mean side 2, flip the disk over. It boots up a (rather crude) arcade-style video game. Your ship is at the lower left corner, and Rama is in the upper right. A stream of meteors streaks diagonally across your path. Your job is to play Frogger, and the meteors play the part of traffic.



Unable to get past the meteors, I could go no further in the game. Unfortunately, nobody I know can get past the meteors. My 19-year-old nephew gave up after two hours. I gave up after three days. (I hear the legendary kid from Jersey who scored three million points on Asteroids is still trying.) Even if you can get to the second screen of the docking game, the program doesn't seem to recognize a landing.

There may be a terrific adventure game here, but the arcade game won't let you get to it. That's too bad because it really does look like it could be fun.

If you could just get past the darned meteors.

David Gerrold

Rendezvous with Rama
Trillium Software
1 Kendall Square
Cambridge, MA 02139
(617) 494-1224
List Price: $39.95
Requires: Apple II Plus, IIe, or IIc; 64K RAM; one disk drive; joystick

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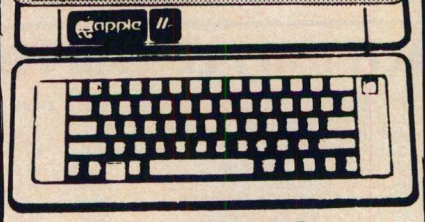

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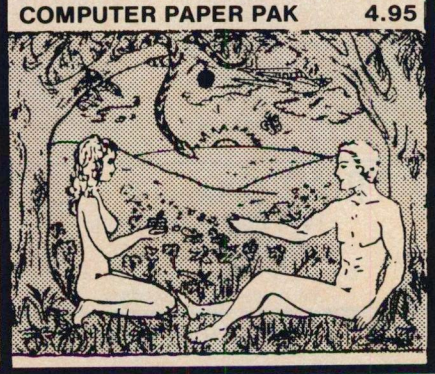

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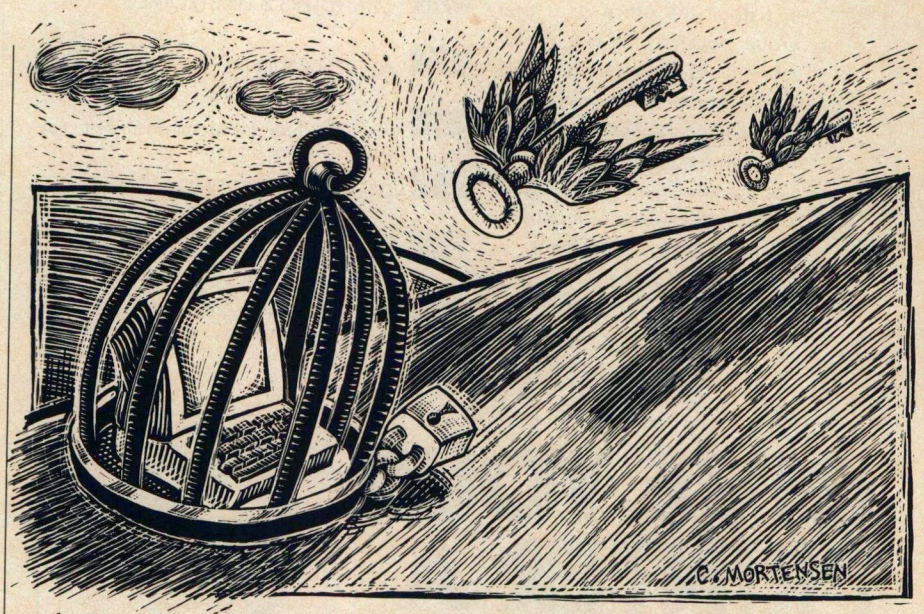
CIRCLE 265 ON READER SERVICE CARD

RESCUE SQUAD
BY MICHAEL CALLERY
Questions from our readers



PRINTING FROM MOUSEPAINT

Q. *I am enjoying my AppleMouse II and MousePaint, but I am having difficulty getting hard copy. The program supports only the Apple Dot-Matrix and Imagewriter printers. How can I get a printout? Can I get a color printout?*

A. The number of Apple-compatible printers and interface cards makes graphics printouts, or "dumps," a programmer's nightmare. Apple chose to support only its products, but don't despair. You *can* print MousePaint graphics by saving the screen to disk, quitting MousePaint, and then using a graphics-dump program. MousePaint uses ProDOS-formatted data disks, so the graphics-dump program must be able to read ProDOS files. Triple Dump from Beagle Bros. is one of the more popular ProDOS graphics-dump programs. Check to be sure that ProDOS, your printer, and your printer-interface card are supported by the graphics-dump program.

Color is another story. The new Apple Scribe printer does print in color—as do several other, more expensive printers. You'll need a program to convert the screen pixels into printer pixels of the correct color. Currently, we know of no ProDOS color-dump program. To print your MousePaint pictures in color, you must first convert them to DOS 3.3 format, using the utility on the ProDOS User's Disk or Apple IIc System Utilities Disk. Once in DOS 3.3 format, the program can read the picture and send the correct information to your printer.

If you don't have a color printer, but you still want color, check out Color Printer from Enhanced Software Products. This program lets you make a color dump on a standard Epson, Gemini, or Apple Dot-Matrix printer. (See "You Can Print a Rainbow," in the June 1984 issue of *A+*, pages 62–64.)

EXPAND QUICKFILE WORK SPACE

Q. *I have an Apple IIe with an Extended 80-Column Card. I have been working with QuickFile to set up a filing system for a large number of records (almost 700). When I had entered a little more than 600 records, the program reported that it had run out of room. I ended up splitting the file, A–M and N–Z, to accomplish my goal. Now I have to do everything twice—sort, print reports, and so on. Is there any way I can extend the QuickFile work space to accommodate more records?*

A. Your problem is that QuickFile operates totally within the available RAM. (Ditto, incidentally, for AppleWorks.) Some other database systems, DB Master for example, operate on disk files and store only small portions of the data in RAM. One solution, then, is to switch to a disk-based database system. Couple a disk-based program with a hard disk and you have a very powerful database-management system. On the other hand, your data will probably need to be reentered into the new program, and a hard disk is not inexpensive. There is a less drastic solution, however: increase your computer's RAM.

The Apple Extended 80-Column Card contains 64K of memory, bringing your Apple to a total of 128K RAM. Although the 6502 microprocessor can use only 64K of memory at a time, it is possible to use extra memory on the Extended 80-Column Card for data or for program segments. QuickFile and AppleWorks already do this. An 80-column card with 128K should effectively double the capacity of these programs and allow QuickFile to accept all of your data. Although Apple does not market such a card, several

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CIRCLE 303 ON READER SERVICE CARD

other manufacturers do (see "The Endless Apple," *A+*, March 1985).

Remember that programs must be written especially to utilize this extra memory; the extra memory will lie idle most of the time. Don't confuse the "extended extended" 80-column cards and disk emulators or print buffers. Disk emulators (such as the Flashcard) and print buffers (such as the MicroFazer) also contain extra memory, but the RAM is not directly accessible to the 6502. On the other hand, with the proper software, the extra RAM on the Extended 80-Column Cards *can* be used as a disk emulator or a print buffer when it isn't being used with QuickFile or AppleWorks.

▸ TYPEWRITER INTERFACE

Q. *I have a typewriter that connects to a computer for use as a printer. How do I connect it, and will it work the way a regular computer printer does?*

A. If your typewriter already has communications capabilities, you need only a cable to connect it to the Apple, and an interface card for your Apple. If your typewriter has a parallel interface, you need an Apple Parallel Interface Card or compatible card. Because your typewriter does not have graphics capabilities, you should not buy a Grappler, Pkaso, or other graphics interface. If you have a serial connection on the typewriter, you'll need a serial-interface card.

With an Apple IIc, you can connect serial devices only, unless you have a serial-to-parallel converter. IIc owners also need a serial cable with a round DIN connector on one end. A knowledgeable dealer should be able to get—or build—a cable for you.

You should install the printer card in slot 1 of your Apple; it can be activated with PR#1. Application software will use the typewriter as if it were a computer printer—with one important difference: it will be slow. Most dot-matrix printers operate between 80 and 160 characters per second (CPS). Your typewriter will creep along at less than 15 CPS. Furthermore, the mechanism of a typewriter is not geared to the relentless flow of information from a computer and may not withstand very heavy use. For this reason, we do not recommend adapting IBM Selectric or other standard typewriters for computer use. ✚

Please send your questions and problems to Rescue Squad, A+, 11 Davis Drive, Belmont, CA 94002.

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```
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X=3.14159
Y=255
```
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```
A$: 5 10 150
X: 10 20 3000
Y: 5 40 55 60
```
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```
10 TEXT: ? CHR$(21): HOME:
   POKE 33,7: REM Replace the
   periods in line 20 with spaces.
20 PRINT ".@@@@@.@@...
   @@@.O.O.@@..^..@
   (.....-.=====./.....\
   .ASCII..ANNIE"
30 C=C+0: N=N+1: POKE 1539,
   173+16*C: FOR X=1 TO 9:
   POKE 1542+X, N+X: S=PEEK
   (49193+X): NEXT
40 IF N-246 THEN 30
```

10 TEXT: HOME: FOR P=0 TO 255: VTAB 1: NORMAL: PRINT "POKE 243,";P: POKE 243,P: LIST: NEXT: REM *Try replacing the 243's with 50's*

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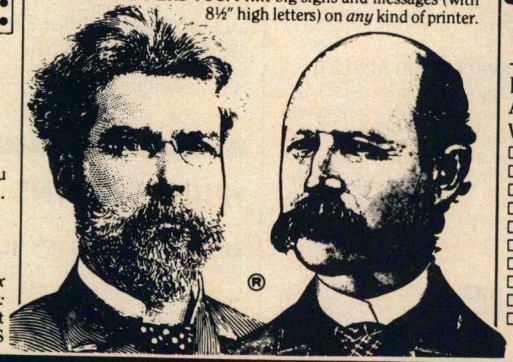

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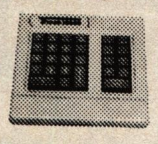

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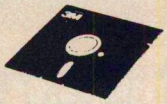

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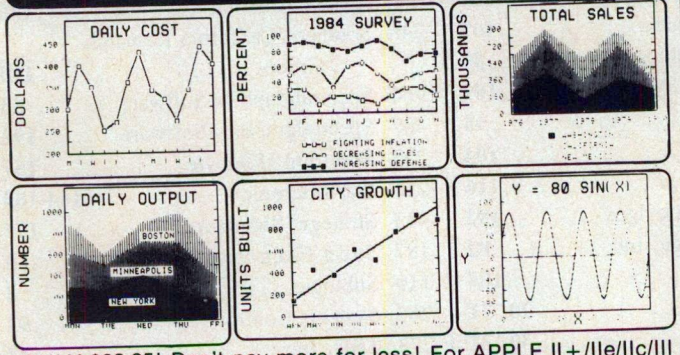

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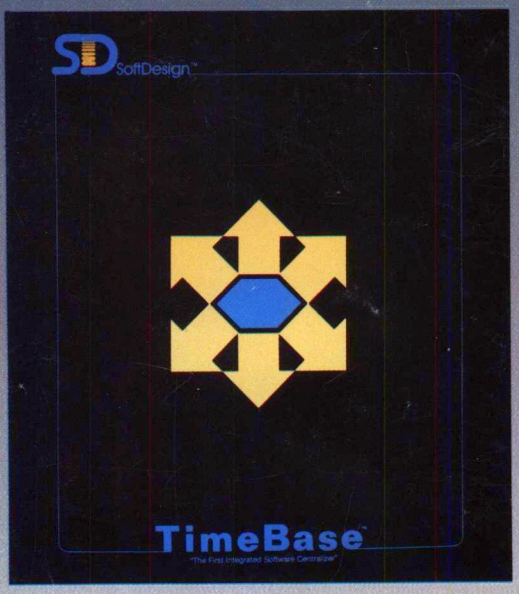

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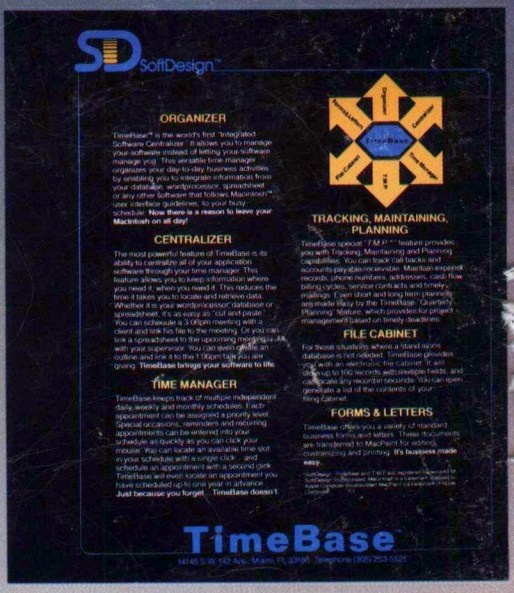

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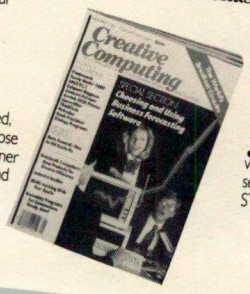

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